

BCAS RESEARCH SYMPOSIUM 2015



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Contents

Page No.

Programme	02
From the Chairman	03
From the Dean, Academic Affairs	04
From the Director, Academics	05
From the Vice Chancellor & Vice-President (Development), London South Bank University	06
From the Vice Chancellor, University of Wolverhampton	07

SCHOOL OF HEALTH SCIENCE

Expression and purification of novel parasitic nematode specific protein for 3D structure	10
Investigation of HBV DNA positivity in a cohort of suspected patients in a hospital based setting	13
Determination of the type of PML-RARa fusion transcripts in clinically confirmed selected group of Sri Lankan patients with Acute Myelogenous Leukaemia	15

SCHOOL OF MANAGEMENT

Impact of Social media on students' attraction for private Higher Education Institutes of Sri Lanka	20
Factors affecting customers' decision towards the adoption of Internet Banking: Reference to the customers in Colombo City Limits	22
The study on External Customer Satisfaction of National Aviation Service in COUNTRY	25
Investigating the Relationship between National Cultural Values, Organizational Commitment and Turnover Intention: A Study on Maldivians employed in International Hotel Chains operating in Maldives	28

SCHOOL OF ELTU

An Analysis on the Destiny of Woman within the Repressed Social Realm Based On the Foremost Feminine Portrayals in Literature	32
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SCHOOL OF LEGAL STUDIES

Humanitarian Intervention into Domestic Jurisdiction on Genocide: Problems Encountered in International Law	38
NATO and New World Order	44
A critical analysis of the issues in implementing International Humanitarian Law in respect of the international and non-international armed conflicts	49
Migrant domestic workers and the legal protection offered to them	53
A Critical Analysis on 'Hybrid Courts' as an effective mechanism to achieving transitional justice	55
White Collar Crimes- The Collapse of the Wall Street Darling, Enron	58

EMERGING TRENDS

Identify and analyse the impact of Mergers and Acquisition on operational performances and shareholder wealth - (Case study on Aviation and Banking sectors in India)	62
Design of a Mobile Handset Antenna for Hearing Aid Compatibility – 'HAC'	67
Structural Health Monitoring using GPR Technique	77
Towards Progressive Realization of Human Rights	83
ICT Performance - Shaping the Internet Use	88
Potential impacts of Building Information Modeling (Bim) on Estimating Practices in Sri Lankan Context	93
Emerging concern of Tuberculosis in Sri Lanka	101
List of Referees	107

Programme

INAUGURATION

- 09.15 am National Anthem
- 09.30 am Welcome: Eng Kawther Musthafa
General Manager - Operations
- 09.40 am Address: Professor Kshanika Hirimburegama
Dean, Academic Affairs
- 09.50 am Address: Eng Abdul Rahman
Chairman/CEO, BCAS
- 10.10 am Address: Guest of Honor, Mr Dian Gomes
Managing Director, MAS Holdings
- 10.30 am Address: Chief Guest, Justice Saleem Marsoof, PC
Judge of the Supreme Court of Fiji, former judge of the Supreme Court of Sri Lanka
- 10.45 am Vote of Thanks - Mr K Tharshananth,
Co-ordinator, BCAS Research Symposium
- 11.00 am Networking with tea
- 11.30 am Key note Address – Mr K. Kanag-Isvaran, PC
- 12.00 noon Networking with lunch

ACADEMIC SESSIONS

- 02.00 pm Departmental Presentation “Emerging Trends”
- 02.30 pm Presentations - Biomedical Science
- 03.15 pm Presentations - Legal Studies
- 04.45 pm Networking with tea
- 05.00 pm Presentations - Business Management & English

From the Chairman

The event “BCAS Annual Research Symposium-2015” is yet another first BCAS is introducing in the sphere of higher education so far as a private institution is concerned. As the Chairman/CEO of BCAS, I am extremely happy to pen this message to the Proceedings of the inaugural Research Symposium.

A Research Symposium is an integral part of a higher education institute where the academics get an opportunity to present their research work and discuss and share it with others researchers. This exercise to be held annually will bear clear testimony to the academic quality of BCAS. The researches thus carried out by the BCAS academics with their students will be shared with others and published.

I am proud that BCAS Campus, while jealously ensuring academic standard has been contributing immensely to the nation building for 16 long years. With seven campuses scattered around the country and an overseas learning center in the State of Qatar, BCAS has lived up to its broad vision “Building Careers - Transforming Lives” and thereby producing useful citizens for Sri Lanka.

The British College of Applied Studies (BCAS) has been in existence in Sri Lanka for the last 16 years serving the youth of the country in their thirst for vocational and tertiary education. It has thus led the way for continuing education in a wide range of subjects to face confidently the national as well as global challenges, for instance, Law, Quantity Survey, Civil & Telecommunication Engineering, IT, Business Management and Biomedical Sciences.

BCAS delivers degree programmes of two well-recognized UK universities: University of Wolverhampton and London South Bank University. It is noteworthy to mention here that BCAS has received many awards and recognitions. The LMD Sri Lanka’s pioneering and the most prestigious business magazine has ranked BCAS Campus as the top private education institution in the country. This recognition makes us stand tall.

Having said that, let me congratulate those who are presenting their research findings at this inaugural BCAS research symposium. I do appreciate their enthusiasm and interest. I am sure this symposium will definitely inspire the other academics and students to present their own research findings bringing out more innovative ideas at the next year’s symposium.

I wish the BCAS Research Symposium a great success.

Eng Abdul Rahman

BSc.Eng (Hons), AMIESL

Chairman/CEO,

BCAS Campus, Sri Lanka.

From the Dean, Academic Affairs

I am honored to send a congratulatory message to the Proceedings of this memorable event- inaugural BCAS Research Symposium, 2015.

BCAS, as a higher education institute, provides the opportunity to students throughout the country, to pursue quality higher education. BCAS fulfills the education aspiration of youth and gives them a hope for future. Having 7 schools in 8 locally and a Qatar Campus internationally, illustrates the patriotic qualities of the Chairman and the efficiency of the management & staff of BCAS. The LMD magazine (the most prestigious & pioneer business magazine in Sri Lanka) reported BCAS Campus as No 1 private higher education institution in the country.

I am happy to note the significant emphasis on quality assurance in all the programs. The Pearson, together with well reputed University of Wolverhampton, and London South Bank University, UK, assures the quality of programs delivered by BCAS.

Research is an important driving force of the economic advancement of a country where Universities and Higher Education Institutes play a key role. Research carried out by academics together with students lead to direct human capital development.

I am happy that academics of BCAS have illustrated a commitment towards the research symposium. Those who would be presenting their research findings would gain multiple skills in training human resources, the pivotal role of an academic institution.

With the annual research symposium becoming an important event of BCAS calendar, research in the fields of law, civil & telecommunication engineering, quantity survey, biomedical sciences, IT and business management would be strengthened. It would enable the academics to conduct research on matters pertinent to the country & globe, create student awareness on current national & international needs and thereby play a significant role in national development while maintaining ethics & culture.

I wish the inaugural BCAS Research Symposium a productive and a memorable event.

Professor Kshanika Hirimburegama,
Ph D (KUL), Doctorate (Honorary-MSU)

From the Director, Academics

BCAS is making a record of history today (18 December 2015) through the inauguration of this event “BCAS Annual Research Symposium”. I am extremely pleased to send this message to mark the occasion. Internationally research plays a key role in the development of a nation and it (Research and Publication) is an essential part of any well-established higher education institute.

The British College of Applied Studies (BCAS) in Sri Lanka has catered to the need of youth of this country in providing vocational and tertiary education for the past 15 years. Research on Information Technology and Engineering at BCAS actually commenced in its infancy itself in a limited way but with strong enthusiasm. Thus started in a humble way, I am proud that the Research and Development Unit headed by a highly capable academics and scholars in IT and Engineering at BCAS and has produced many enterprising alumni of BCAS.

The outcome of some R&D by the same highly trained personalities who carried out the researches during their learning period at BCAS are already in the market as products. I am indeed so proud that the small journey which began in R&D, has now expanded in great magnitude in all the fields of BCAS. We have now come to the maturity of organising our own symposium like this.

I do congratulate and appreciate those who are presenting their research findings at this inaugural symposium conducted by BCAS. I hope it will motivate other potential academics and students to embark on innovative researches and present the same at the next year’s research symposium.

I wish the Symposium a great success.

Eng M C M Az Mafeel

BSc Eng (Hons), PG Dip, MIET(UK), MIEEE(USA), AMIE(SL)

From the Vice Chancellor, London South Bank University

I am delighted that the British College of Applied Studies is organising its inaugural research symposium. Research is essential for the enhancement of knowledge and forms the key underpinning for high quality higher education. Research is also critical to develop enterprise at BCAS. London South Bank University's strategy is based on integrated portfolio of research, teaching and enterprise. As research takes root at BCAS, London South Bank University looks forward to building on our existing collaboration to include research and enterprise for the benefit of our stakeholders.

I congratulate BCAS on organising their first ever Research Symposium and I wish BCAS success with the event.

Professor Dave Phoenix OBE
Vice-Chancellor and Chief Executive Officer
London South Bank University

From Vice-President (Development), London South Bank University

I am pleased to learn about the inaugural BCAS Research Symposium and I congratulate BCAS on this exciting initiative. BCAS has already established it-self as an important source of professional higher education in Sri Lanka. Research is fundamental to the quality higher education and engagement with business and industry. I hope this Symposium catalysed the growth of research and development, and its impact on the economy and the society in Sri Lanka. I very much look forward to supporting our key partner, as BCAS develops research with impact in Sri Lanka.

I wish the first research event at BCAS every success and congratulate BCAS on this important initiative.

Professor Rao Bhamidimarri
Vice-President (Development)
London South Bank University

From the Vice Chancellor, University of Wolverhampton

As a university in the UK with over 23,000 students and more than 2,500 international students on-campus, the University of Wolverhampton plays a vital role in the delivery of high quality education and training in the UK and to the wider global community. The University of Wolverhampton is very proud to have worked with BCAS for the past 5 years to deliver a range of undergraduate and postgraduate programmes in law, business and construction.

I am therefore delighted to congratulate BCAS on their inaugural research symposium which has been created in order to further develop the BCAS research culture amongst both staff and students. Research is crucial to the development of the enquiring mind and to pushing at the forefront of knowledge. It is only through the promotion of research and scholarship that we collectively achieve the aspirations of higher education.

The University of Wolverhampton has an extensive range of research partners in the UK and overseas. We work in close partnership with national governments, donors, agencies, NGOs, educational institutions and consulting companies in Asia, Africa, Latin America, Europe and the South Pacific. These links have proved invaluable in building vibrant academic networks that have secured significant external funding with overseas partners over the last decade. The University has invested heavily in growing our research activity and as a result, we now have international recognition for much of the research we undertake and look forward to exploring opportunities to collaborate on research projects with BCAS.

On behalf of the University of Wolverhampton, I would like to take this opportunity to wish BCAS staff and students a stimulating and enjoyable research symposium and we very much look forward to the sharing of outcomes.

Professor Geoff Layer
Vice-Chancellor

BCAS CAMPUS (1999 - 2015)



Established in 1999, British College of Applied Studies now popularly known as BCAS CAMPUS has rapidly grown into a top-ranked vocational and tertiary training providers in Sri Lanka with comparatively a large number of students in the private sector higher education with strong UK collaborations.

Besides its Main Campus in Colombo, BCAS CAMPUS has branches in principal cities, such as Mount Lavinia, Kandy, Jaffna, Kurunagala and Batticaloa and one at Kalmunai in the Ampara District. A highly successful overseas support centre is in operation in the State of Qatar for the last eight years since 2007. The institution is thus viewed in high esteem in Sri Lanka and in the Middle East job market for its exceptional quality, recognition and market relevant training.

We deliver courses in a variety of streams from Foundation to Bachelor's and Master's levels through solidly established academic collaborations with the University of Wolverhampton, UK and the London South Bank University, UK apart from Pearson UK (formerly Edexcel) the globally-recognized qualification awarding body. Our relationship with Edexcel UK (now known as Pearson UK) dates back to 2002. As an ISO 9001:2008 certified institution, we maintain the highest quality and standards in all our deliverables.

We have pioneered higher education streams by launching innovative study programmes - Quantity Surveying, Telecommunication Engineering, Civil Engineering, Law, IT, Business Management, Biomedical Science, etc. To top it all, we deliver several top-up courses on behalf of the University of Wolverhampton. They are BSc (Hons) Quantity Surveying, LLB (Hons), BSc (Hons) Biomedical Sciences, BA (Hons) Business Management, BSc (Hons) computing & Management of IT, MBA and MSc Construction Project Management. More than 340 students have already graduated through BCAS Campus for these degrees awarded by the University of Wolverhampton in three consecutive graduation ceremonies in 2013, 2014 and 2015 hosted by us for the university.

A further BSc (Hons) Commercial Management (QS) is awarded by the London South Bank University (LSBU) is also being delivered by us. The first batch of 58 LSBU students were awarded the said degree last year (2014) along with 1174 students receiving their Pearson's BTEC Diplomas. In the current 2015 graduation ceremony 75 students are receiving their degree awards from the London South Bank University while 500 plus students are also receiving their Pearson, UK's HND. It is envisaged there will be more students receiving London South Bank University degrees with the university Civil Engineering top-up degrees introduced this year (2015).

Our facilities and resources are the best and continuously updated. The recent acquisition of a spacious premises on the Galle Road, Mount Lavinia with the state of the art facilities exclusively for Bachelor's and Master's degree courses even better environment for the student. Timely and regular international verifications and audit are done by the Pearson, UK as well as our collaborative UK university partners. On an added note, BCAS was selected as the Number One private Higher Education Institute amongst the Private Sector Higher Education providers in Sri Lanka by the pioneering prestigious business magazine LMD.



SCHOOL OF HEALTH SCIENCE

Expression and purification of novel parasitic nematode specific protein for 3D structure

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Abstract

The principle objective of this research project is to express and purify novel parasitic nematode-specific protein of *Setaria digitata* by previously prepared clone. Expression was carried out by cloning recombinant SDUP (*Setaria digitata* uncharacterized protein) in *Escherichia coli* strain BL21 (DE3). The co-expression of SDUP using chaperone plasmid mediated system (pGro7) in the presence of L-arabinose in the culture medium. It has been indicated a significant increase of the protein in the soluble fraction according to the previous study (Rodrigo *et al.*, 2014). Successful purification of recombinant SDUP, both from soluble and insoluble fractions carried out using Ni – NTA affinity chromatography. Interacting proteins were separated using SDS-PAGE analysis and these bioinformatics analysis revealed a single band having expected size of 24 kDa. In conclusion SDUP is hydrophobic in nature and such protein can make hydrophilic by proper selecting the inducer concentrations and induction temperature and its duration.

Author keywords

Setaria digitata, Uncharacterized protein, Chaperon, Co-expression

Introduction

Identification and characterization of parasitic nematode-specific genes are useful to understand the biology behind the parasitism and then to evaluate the candidacy of these biological/biochemical processes to be used as targets for combating nematode parasitism that are of paramount importance to successful medicine and sustainable agriculture. This study was carried out to express and purify a novel gene product, SDNP identified from cattle filarial parasite *Setaria digitata* to which homologous counterparts were found to be present only in parasitic nematodes having sequence similarity 79% and 77% with the human lymphatic filarial parasites of *W. bancrofti* and *Brugia malayi* respectively. 81% to subcutaneous filarial parasite of *Loa loa* (the eye worm) and significant sequence similarity with some other parasitic nematodes. *S. digitata* is living in the peritoneal cavity of cattle and generally nonpathogenic in their natural host, but transmission of infective larvae into non-permissive host such as sheep, goats or horses can causes fatal neuropathological disorders known as cerebrospinal nematodiasis (CNS). CNS is a disorder resulting in major dysfunctioning of the central nervous system, producing symptoms of motor weakness, ataxia, lumbar paralysis and ultimate death of infected animals. Therefore, *S. digitata* is responsible in causing fatal diseases to livestock and cause significant economic losses livestock farming in tropical countries. Further, that this nematode can also infect humans and cause swelling, allergic reactions, enlarged lymph nodes, eye lesions and lung inflammations can cause when human are infected by this species.

Experimental

A colony contain SDNP cloned into pET vector was inoculated into LB medium containing 20 µg/ml chloramphenicol and 50 µg/ml ampicillin. Different amount of L-arabinose was added for the induction of chaperone expression. pGro7 that were co-transformed with pet vector containing SDNP according to the manufacturer's instructions. Cultures were incubated at 37°C with shaking (250-300 rpm) until OD₆₀₀ reached to 0.4 – 0.6 and left them at 15°C for 30 minutes. Then cultures were induced with IPTG to final concentrations of 0.4 mM, 0.6 mM or 1 mM and incubated at the temperatures of 25°C, 28°C, 30°C or 33°C for the durations of 1 h, 3 h, 5 h, or 7 h. Samples were adjusted to the same OD₆₀₀ value for analysis for expression levels and solubility for the target protein by SDS-PAGE.

Preparation of bacterial cell lysate and purification of the 6×his-tag protein was performed according to the supplier's instructions given in the manual of Ni-NTA His-Bind Resins (Novagen). Culture pellet was re-suspended in 1× NI-NTA binding buffer (300 mM NaCl, 50 mM Sodium Phosphate buffer, 5 mM Imidazole, pH 8.0) in 2-5 ml per gram wet weight. Lysozyme solution was added to a final concentration of 45-60 KU/g. samples were incubated at 30°C for 15 minutes and cells were disrupted by sonication having PMSF final concentration of 1 mM. Samples were centrifuged at 10,000× g for 20 - 30 minutes at 4°C to obtain clear cell lysate. Cell lysate was loaded on the NI-NTA column, pre-equilibrated with 1× NI-NTA binding buffer. The column was washed with 1× NI-NTA wash buffer (300 mM NaCl, 50 mM Sodium Phosphate buffer, 20 mM Imidazole, pH 8.0) and recombinant protein was eluted by minimum volume of 1× Ni-NTA elution buffer (300 mM NaCl, 50 mM Sodium Phosphate buffer, 250 mM Imidazole, pH 8.0). Flow-through, washed fractions and eluted fractions were analyzed by SDS-PAGE. Protein samples were concentrated by Amicon Ultra-15 centrifugal filter devices and the concentration was determined by Bradford method.

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Investigation of HBV DNA positivity in a cohort of suspected patients in a hospital based setting

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Author Keywords

Hepatitis B, Molecular Diagnosing, hospital base setting in Sri Lanka

Introduction

Hepatitis B is a life-threatening liver infection caused by the Hepatitis B virus (HBV). It is considered as a global health problem and can cause chronic liver disease, which can lead to cirrhosis of the liver and liver carcinoma. This virus can inhibit the normal function of liver, lead to pathological damage. Some people may have chronic infection, which can lead to risk of death because of cirrhosis of the liver and the liver carcinoma (WHO, 2014). The hepatitis B virus was discovered in 1966, during that time 350 million people were suffering from HBV infection in the world. Hepatitis B surface antigen was the first identification. Dr. Baruch Blumberg was offered the Nobel Prize in physiology or Medicine in 1976 for discovering the HBsAg. Hepatitis B is the main cause of chronic hepatitis, cirrhosis, and hepatocellular carcinoma (Lee, 1997). HBV is a hepatotropic DNA virus with a double stranded DNA molecule and there are about six genotypes, which infect human.

There are specific virological methods for the diagnosis of hepatitis B virus in humans. Hepatitis B surface antigen testing (HBsAg), Hepatitis B e antigen testing (pre-co antigen), antibodies for co-protein of the virus and HBV DNA testing include some of them. Of these tests e-antigen testing and DNA testing co-relate with detecting active viral replication. Hepatitis B DNA testing not only considered as a confirmatory test for HBV but also important in detecting mutant strains of the virus and evaluation of response to antiviral treatments. There are many markers for the detection of the HBV viruses and these serology markers are used for diagnosis of HBV infection where HBsAg is considered as the hallmark test for screening of HBV infection. Hepatitis B DNA (HBV DNA) can use as a confirmatory test to detect the presence of Hepatitis B virus DNA in a person's blood and indicates active viral replication. Presence of HBV DNA also correlates with the detection of HBeAg in blood. The basis of DNA testing for HBV is by isolating the viral DNA molecule and in vitro amplification of the DNA by polymerase chain reaction (PCR) (Manamperi *et al.*, 2011).

This is a research conducted to determine the Hepatitis B DNA positivity in patients in a hospital based setting in Sri Lanka. Viral hepatitis was listed as one of the communicable disease in Sri Lanka in 2001 (Disease control Programme, 2001). Hepatitis A is the most common type of viral infection in the country and it was endemic in most of districts in Sri Lanka during the year 2001 and annual viral hepatitis admission rate to government hospital in Sri Lanka was 22.5 per 100 000 population in 2001 (Disease control programme, 2001). On the other hand, prevalence of Hepatitis B about 0.27% to 2.5% according to the epidemiology and serological surveys done in Sri Lanka in 2001.

Experimental

Patients who were presented with symptoms of hepatitis B infection prior to treatments at the Durdans hospital Sri Lanka during the period of 2014 November to 2015 March, were selected. were chosen for this study. All the samples that had been processed under this project are surplus samples arising from samples referred to the molecular laboratory for routine diagnostic. All the patients' samples were independently tested by resident molecular biologists at the laboratory for the purpose of preparation of test reports. At the same time, the samples that were processed under this project were independently tested for generating patients test reports under a different code. Therefore, Patient's data and other relevant clinical information had been blinded and separate code was assigned for the samples that were used for this research. 10 individual samples were tested who were suspected for HBV infection by using conventional PCR method inside the molecular diagnostic lab attached with Durdans hospital Sri Lanka. All the samples and Hepatitis B suspected sample referred by clinicians. There are specific standard operation procedure (SOP) adopted by the laboratory for all the diagnostic works. SOP was closely followed during the project work. After the sample analyzing is completed, the results were compared with the routine diagnostic test reports generated in the lab. In this sample population of 10 individuals, three were positive for hepatitis B DNA and this was confirmed by independent analysis of same samples by the laboratory staff. To have meaningful result on prevalence of HBV in Sri Lanka, need to do with high number of sample population proportional to the population in Sri Lanka. According to the annual bulletin of 2012 which is published by Sri Lankan Epidemiology Unit of Ministry of Health, 2146 cases of viral hepatitis were reported and from those reported patients 1672 (77.91%) cases were clinically confirmed. Most of the confirmed patients are males who are belonged to 15-19 years (15.72%), 20-29 years (34.37%) and 30-39 years (23.78%) (Annual Heath Bulletin, Sri Lank, 2012).

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Determination of the type of PML-RARa fusion transcripts in clinically confirmed selected group of Sri Lankan patients with Acute Myelogenous Leukaemia

R. Rajphriyadharshini

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Abstract

Acute myelogenous leukaemia (AML) is a lethal blood cancer, where about 10% of the disease occurs due to the presence of the reciprocal translocation (PML-RARa) between genes, Pro Myeloid Leukaemia (PML) and Retinoic Acid Receptor- α (RARa). The PML-RARa translocation is categorized into three different transcripts such as bcr1 (long), bcr2 (variant) and bcr3 (short). Variations of PML-RARa transcripts are evident to influence the resistance for the conventional treatments for AML. Hence this study detected different PML-RARa transcripts present in 50 clinically positive AML patients in Sri Lanka, using PCR and were further analysed with chi square test. The results revealed the prevalence rate of bcr 1 as 82.5% and that of bcr 3 as 17.5%. This research concluded bcr 1 isoform that is particularly resistant to All trans retinoic acid treatment as the predominant transcript in Sri Lanka.

Author Keywords

AML, Translocation, All trans retinoic acid, PML-RARa

Introduction

Acute myelogenous leukaemia (AML) is a type of blood cancer. It causes the body to rapidly produce large amount of immature myelocytes called blast cells that lack the ability to elicit their immunological functions (Bassi and Rego, 2012). AML accounts for 34% of all leukaemia cases, and around 351,965 people were diagnosed with the disease in 2014, worldwide. According to Cancer registry (2014), AML has been reported to be 38% of all cancer cases of Srilankan population. The prominent reciprocal translocation, that was focused in this research was, the PML-RARa translocation, a molecular marker of AML. It was observed in nearly 99% of all AML patients. PML-RARa translocation is formed by the fusion of the RARa (retinoic acid receptor α) gene on chromosome 17 with the PML (pro myelocyte leukaemia) gene on chromosome 15. PML-RARa fusion gene plays a vital role in leukemogenesis by acting as both tumor modifier and tumor metamorphoses (Schnittger *et al.*, 2011). It blocks the myeloid differentiation as well as induces the proliferative advantage of myeloid cells by inhibiting the function of RARa and PML genes respectively. Chatterjee *et al* (2014) showed that the RARa break point region was invariable and is located in the 2nd intron of the RARa gene. Whereas the break point cluster region (bcr) of PML gene vary due to alternative splicing of PML sequences and thus categorized into 3 types; bcr 1(long), bcr 2 (variant) and bcr 3 (short). Bcr 1 is the most common PML-RARa transcript that accounts for 70% of AML patients. It consist of PML exon 5 and 6 (Hasan *et al.*, 2014). The 2nd frequent transcript is bcr 3 formed by the fusion of PML exon 1. It is detected in approximately 20% of AML positive

cases. The breakpoint region referred as bcr 2, exhibits intermediate length of PML sequence, around the exon 6 and is observed in 10% of AML patients. Multiple studies found that, such variation in the PML region have a greater influence in resistance to the leukaemia treatment. The classic treatment for AML is All Trans Retinoic Acid (ATRA). Never less ATRA made 90% of patients to achieve complete remission, relapse still occurred in 15-25% of AML patients. Rather than bcr3, bcr1 exhibit resistance to ATRA treatment and induces relapse of the disease. It was identified that expression of a distinct CD2 antigen and NB4-R2 colonies in bcr 1 could be the possible reason for such resistance (Bassi and Rego, 2012). Furthermore bcr 1 lacks a stretch of 158 amino acid (exon 4-6), which could be another cause of such phenomena. This study was designed to determine the prevalent type of the PML-RARa fusion transcript in Sri Lankan patients with AML, which may aid to hypothesis specific therapeutic facilities for the AML patients with predominant PML-RARa transcript in Sri Lanka.

Experimental

Fifty clinically positive AML peripheral blood sample were collected and the whole blood RNA was extracted from the blood samples. Using the extracted RNA, cDNA was synthesized by R-T PCR. The cDNA was amplified by the PCR. Furthermore the nested PCR was carried out under standard cyclic parameters. Thereafter it was followed by gel electrophoresis to identify the presences of PML transcripts, with reference to their molecular weight. The prevalence of PML-RARa transcripts was determined through chi square test by SPSS software and the results were further compared with the retrospective studies. The presence of a PCR band having a size of 319bp was interpreted as positive for bcr 1, while the presence of a PCR band having size of 220 bp was interpreted as positive for bcr 3. The study revealed the prevalence of bcr 1 as 82.5% (43 patients) and the prevalence of bcr 3 as 17.5% (7 patients). The obtained prevalence rate of PML transcripts were compared to the published literatures of other countries by statistical test. The p value was determined as less than 0.05. The study indicated as similar to the current study, bcr 1 was found to be the predominant isoform in all other studies carried out by different countries. It also pointed out that the rate of bcr1 transcript in Sri Lanka was significantly higher (82.5%) than the bcr1 rate reported in literature of other countries (52%-65%).

This study is a prospective study of the PML-RARa transcripts in AML patients. To my knowledge, the present study is the first study demonstrates the prevalence of PML-RARa isoforms in Srilankan AML patients. This research concluded bcr 1 isoform that is particularly resistant to ATRA treatment as the predominant transcript in Sri Lanka and showed the importance of the detection of such transcripts in those patients before initiating the treatment, which leads a pathway for discovery of novel therapeutic drugs in future.

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Impact of Social media on students' attraction for private Higher Education Institutes of Sri Lanka

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The social media has connected businesses and many lives together as an information and communication hub. Education sector too has been affected by this technology over the past years. This research examines the effect of elements of social media on students attracting to the private higher education Institutes of Sri Lanka based on both primary and secondary data. Further the research examines the patterns on attraction through social media on demographic information the pattern of relationship of social media usage and technological factor. This study reveals how trustworthiness on social media networks attract the students to the target context and discuss how it influences to make a valued student base with positive word of mouth. This report further examine the distribution of different social media platforms in Sri Lanka among the students in higher education base on the sample gathered. The research is oriented on a deductive approach where the investigation is based on a quantitative research methodology.

Author Keywords

Social media, Culture, Trustworthiness, Technology, Higher Education Institute (HEI)

Introduction

Social media and Networking has become a growing phenomenon which has an impact on business and academic use. Via web based and mobile technology, the social media technology allows individuals and corporate to connect and share information. Social media sites are the web-based services that allows individuals to connect by constructing public or semi-public profiles with in a bounded system (Boyd and Ellison, 2008). The social media web sites are now used by the higher education institutions since the social media engagement of the students in higher education is more. It has become a powerful marketing tool in Education services industry which gives a strong Word of Mouth (WOM). It allows the existing students discuss about the success stories, achievements, the facilities and the teaching quality whereas the potential students may gain an interest of finding about the education programs at the institution. It used among the students to share information related to the subjects and also to connect with their seniors and juniors.

Experimental

In order to carry out the investigation, a quantitative research Methodology was adopted to find the numeric values and also qualitative research methodology was adopted to find their personal opinions in order to draw the final conclusions and recommendations of this research. A research questionnaire is created to analyze the impact of social media on student attraction to private HEI. The questionnaire was more focused on Facebook, google+, Twitter, Myspace and LinkedIn. The questionnaire was precise and simple and it used the Likert scaling. The sample target population was 150 in a particular private HEI but the data was collected randomly from 45 students only. Since the data was

collected during end semester period the students were busy for their exam preparations and also ongoing examinations. There were few students who were just registered on the day of the data collection for the upcoming new intake. There were few limitations one is that the data is limited a sample of 40 students. The target sample was 150 but the researcher was able to give the questionnaire to 45 students. From that only 40 was used as successful samples. Therefore all the findings and recommendations are limited to this sample of 40 students. Further this has been limited to Western province of Sri Lanka but investigating students from many higher education institutes would have given more relatively large picture and may be culture would have been correlated to student attraction in a larger context.

According to the data gathered from the sample it is transparent that the many students are using the Face book for social networking more than any other social media networks listed. Today in Google Sri Lanka the most search keyword is none other than Face book (Readme, 2013). Further it was shown that more number of students are using the social media on their phone and they use mobile connectivity. The main purpose of the study is to see whether there is a correlation between the student attraction and Culture, technology and trustworthiness. The result statistically revealed that there is negative relationship between the culture and the student attraction. Therefore the researcher concluded that when students attracts to a higher education institute the through social media the cultural implications does not play a major role.

The correlation between the Technology and the attraction showed a positive correlation and the researcher concluded that the statistical evidences proved that there is a strong relationship between student attraction through social media and technological adaptation. The information age has an impact on the younger generation specially age 18-29 which we known as the millennial group. In a technology driven world their adaptability to technology is fast and with the web technology they are more focusing on information which are available online. This has an impact on Higher education Institutes as well because the generation Y is more engaged in online learning environments, blog, social groups and forums etc. so that they spend more time on internet through different devices such as Mobile phones, Tablet PC, and laptops which are easy to use at any place due to portability. Further according to the Pearson Correlation analysis there is a very strong correlation between trust and attraction. There is a correlation of 0.653 at 95% confidence interval. Therefore researcher concluded what is important for the students to attract to Higher education is the trust that they place on the online reviews by friends, known people and general unknown fans. According to the calculated statistics in regression analysis trustworthiness is the independent variable which contributes more to the attraction of students to the higher education institute.

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Factors affecting customers' decision towards the adoption of Internet Banking: Reference to the customers in Colombo City Limits

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Abstract

The objective of the paper is to investigate the factors affecting the decision towards the adoption of Internet banking. Findings revealed that the Awareness, Perceived Usefulness and Perceived Ease of Use are the key predictive factors of adoption of IB customers in Colombo city limits. Further, the demographic factor: education, plays a moderator role.

Author Keywords

Internet Banking, e-banking, Technology Adoption, Innovation, TAM

Introduction

This paper reports the findings of a study concerning the factors affecting the adoption of Internet Banking carried out among the internet banking customers in Colombo city. The research framework was based on theory of Technology Acceptance Model (TAM) and related theories. The constructs of the study namely Perceived Usefulness and Perceived Ease of Use, Awareness and Security Perception were adopted from the empirical studies carried out on the adoption of Internet Banking.

This study could be significant in many aspects. It would help banks to increase their market share by introducing new strategies which may attract customer towards IB and this study would immensely contribute to the very little availability of literature in a country like Sri Lanka. Further, this study could create awareness among the non-users of IB in Sri Lanka which would result in understanding the usefulness of this innovative banking feature.

Conclusion of the research study implied that internet banking beneficial to both banks and customers especially in terms of time and cost. Banks should take measures to influence the internet banking adoption through promotions and new strategies. The study reveals that the perception on Internet Banking in terms of Security is not a significant factor and it is because of recent increase in awareness and knowledge on technology among people. Customers should adapt this emerging feature as it increases new opportunities and efficiencies for managing their finances and businesses. Governments too should encourage and facilitate people and banks to go ahead with internet banking as it is an effective tool or medium to make our local businesses go online globally and it will definitely lead to the economic growth and development of the country.

Experimental

Questionnaire survey was conducted among the internet banking customers in

Colombo city and 201 completed responses were gathered randomly from internet banking customers. Descriptive analysis were carried which showed that even though considerable people were aware about internet banking, most of them were resistance to adopt internet banking. Correlation analysis and Multivariate hierarchical regression analysis were used to examine relationship of four hypotheses with actual intention to adopt internet banking.

Results revealed that the factors: awareness, perceived usefulness and perceived ease of use play a significant role in influencing the intention to adopt of internet banking while the factor: perceived security does not significantly influence the intention to adopt of internet banking. In the meantime, it was found that the demographical factors such as gender, age and income have no moderating effect on neither of the relationships between adoption of internet banking and independent variables of the study. But the demographic factor: education, has the moderating effect on variables of this study.

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The study on External Customer Satisfaction of National Aviation Service in *COUNTRY* (*Country Name withheld*)

*(In the case of National Aviation Services, *COUNTRY*)*

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Abstract

National Aviation Services in *COUNTRY* commenced its operation as a ground handling company in 2003. This profitable private company also expanded its services to various other international airports. From 2013 its contracted airlines in *COUNTRY* have consented towards another handling company due to constant complains from their customers. Research was initiated to identify gaps and the root causes of these customer complaints.

Diligently prepared questionnaires were distributed among customers in-order to gather information on the service rendered. This deductive research approach was based on operational framework which was developed meticulously scrutinizing the literature review. SERVQUAL model was utilized to recognize the impactful factors that perceived service calibre. Fundamentally insufficient airport facilities are the core finding that affected overall customer satisfaction. In addition lack of resources in customer contact points and their appearance have viably contributed to customer dissatisfaction.

Findings highlighted are pivotal to Airport service provider to develop strategies to enhance customer experience along with stake holders of *COUNTRY* airport. Crucially external customers are strongly recognized that airport facilities are part of airline provision and they are considered as key elements of measuring the quality of service delivery. This has empowered the airlines and service providers a responsibility to rectify these issues by addressing them to relevant authorities in order to provide pleasant transitional airport experience to its customers.

Introduction

Air transportation is an indispensable mode of transportation in global community. It has become an inexorable imperative which operates in a highly competitive and challenging environment. Ground handling companies around the world provides airport services to airlines by focusing on every crucial aspects of the aviation industry in a safe and secure manner. Airport services mainly consist of ramp, passenger, cargo and engineering services. Ground handling companies also known as airline service providers.

National Aviation Service in *COUNTRY* is a ground handling company who provides airport services to many airlines operates through *COUNTRY* International airport. From 2003 to 2013 they were able to attract airlines gradually that were under the services of *COUNTRY* Airways as well as new airlines who commenced their operations to *COUNTRY*. They were able to preserved explicit level of services towards its internal and external customers.

Presently it provides services for twenty airlines and operates as a successful private

company at *COUNTRY* International Airport. Their internal customers (Airlines) are British Airways, KLM, Lufthansa, United airlines, Emirates, Qatar airways, Sri Lankan airlines, Jazeera airways, Air Arabia, Jet Airways, Egypt Air, Etihad Airways, Oman Airways, Fly Dubai, Ethiopian Airline, Cebu Pacific, Royal Jordan airways, Fly Nas, Iraqi Airways and Air Koryo (seasonal). Apart from airlines; customs, immigration, airport authorities and airport security are their main stakeholders.

From 2013, despite their successful business expansion, many airlines that are under the service of National Aviation Service in *COUNTRY* have consented to join back to its competitor. Furthermore there were many complaints from customers in relation to their overall experience at the airport. From 2003 till date number of passengers who travel through *COUNTRY* have been increasing. Therefore Growing demand, increase multicultural external customer base and experience oriented customers and their high perceptions are constant challenges confronted by the company.

Methodology

Research is carried out on deductive approach by gathering theoretical aspects of service quality. A combination of quantitative and qualitative methods was adhered to this research by providing questionnaire to external customers. Questionnaire in this research were included simple, consent closed questions and feedbacks. It was adopted the Self – administrated, delivery and collection questionnaire type. Saunders, Lewis, and Thronhill (2009) have identified this type is more pragmatic for travel related researches.

Parasauraman's SERVQUAL model and its variables were adopted in this research questionnaire. The layout of the questionnaire underpinned with conceptual framework which has covered the determinant of service quality in three stages of customer contact points (check-in, information desk and boarding gate). Questionnaire included with few personal questions such as gender, age, nationality to categorize potential customer's background. Questionnaire of this research was fully incorporated with the likelihood rating questions due to its simplicity and convenience of responders (Saunders, Lewis, and Thronhill, 2009).

Questionnaire was limited to three pages by adopting brief questions, making it short as possible focusing on key areas of the research in-order to gain maximum accurate response rate. In addition questions were sub divided into three main areas encompassing crucial customer contact points of check-in, information desk and boarding gate at the airport. Due to multi-national customer base, questionnaires were also prepared in Arabic language.

Target population of this research were all customers who traveled through *COUNTRY* international Airport. From Total population, target frame were the customers who traveled in twenty airlines which were handled by *COUNTRY* National Aviation services. Consequently from target frame of each airline, five passengers were chosen through simple random sampling technique where probability of being selected is equal. Therefore total of hundred passengers were represented the whole population of customers that travel through all airlines which handled by National Aviation Services at *COUNTRY* International Airport.

All the data was collected and analyzed accordingly, in order to measure the level of satisfaction and to identify the factors that affect to external customer satisfaction. Data was analyzed using statistical software SPSS (version 20) and Microsoft EXCEL (2007) to determine the level of external customer satisfaction. Reliability test was carried out in every variable to ensure best outcome of the questionnaire. When the data was not distributed normally non parametric tests were used for the analysis. Furthermore Spearman's rank correlation test was carried out to check the correlation between independent variables.

During statistical analysis a specific score was given to grades of the questions given by the external customers as Excellent = 4, Good = 3, Poor = 2, Very poor = 1. Then the mean score for each set of questions of independent variables were calculated separately and those were used to calculate the overall mean of the customer satisfaction of the independent variables. Those scores were also used to calculate the overall customer satisfaction of the service quality of the National Aviation Services.

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Investigating the Relationship between National Cultural Values, Organizational Commitment and Turnover Intention: A Study on Maldivians employed in International Hotel Chains operating in Maldives

Aishath Shimaz

Abstract

The relationship between organizational commitment and turnover intentions among employees proves crucial for organizations seeking maximum retention of its skilled resources. Unfortunately, limited attention is given to the role played by work-related cultural values at a national level on the employee's commitment to organization and its resultant effect on turnover intention. Despite numerous literature generated on cultural dimensions, organizational commitment and turnover, most studies were conducted in the Western organizational contexts. Hence, these findings may not be applicable to a small South Asian nation such as Maldives, primarily due to the vast difference in economic, social and cultural environments.

Hence, in view of employees from one national identity sharing society's norms and being influenced by societal norms pertaining to obligations this study is concentrated on finding the relationship between National Cultural Values, obligation-based component of Organizational Commitment and Turnover Intention.

With previous literature established on cultural dimensions of Maldives contributing to construct a conceptual framework, five hypotheses were proposed, with the intention of testing the significant relationships among the constructs.

The self-administered questionnaire responses from 154 respondents indicated all cultural dimensions of having a positive, however, weak correlation with organizational commitment and turnover intention. Results of hypotheses revealed Masculinity and Uncertainty Avoidance of having a significant relationship with Normative Commitment and Turnover Intention.

With most cultural research conducted on Western contexts, this study contributed to the knowledge body of cultural studies, specifically in the Asian region and particularly to the Maldivian tourism industry.

Author Keywords

Work-related cultural values, Normative Commitment, Turnover Intention, Power Distance, Masculinity, Uncertainty Avoidance, Individualism, Short-term Orientation.

Introduction

Against the backdrop of globalisation and increasing multinational corporations, a greater comprehension of cultural dimensions becomes a key requirement. Heightened Internationalization in political, economic and social arenas has led to an even greater need of interpersonal cross-cultural associations and understandings across the globe. The Maldives, being renowned as an idyllic tourist destination, has several international hotel chain brands operating along with the country's local resort managements. While

both local and foreign resort managements recruit fairly an equal amount of local nationals, with variations in wages, accommodation facilities, allowances, service charges and other aspects of employment being comparatively minimal, the local management resorts, records a higher turnover of its local staff.

Previous researches indicate varying work-related attitudes being predictable from different national cultural values. National Cultural Dimensions regarded as similar values, beliefs, attitudes and behaviours shared by a group of people within a geographic region [ref 1] due to sharing the same history language and religion [ref 2], and which becomes embedded into all aspects of life within that society, adds in to the idea of work-related attitudes and values of Maldivian employees being of similar characteristics and nature. In similar terms, researchers of organizational commitment propose the commitment of an employee towards the work organization being conditioned on the desire, need or obligation [ref 3] to remain being employed.

Research Body

Accordingly, in view of employees belonging to one national identity being influenced by societal norms of “bound by obligation” play a most significant role in shaping employee turnover decisions. However, despite a great deal of literature generated on cultural dimensions, organizational commitment and turnover, most studies were conducted in the Western organizational contexts. Hence, most findings may not be applicable to a small South Asian nation such as Maldives, mainly due to the vast difference in economic, social and cultural environments. Therefore, though extensive research exist in relation to cultural studies and on combinations of cultural studies with commitment, a research gap on the association between organizational commitment due to obligation and Turnover Intention in a national level needs fulfilled.

Accordingly, with the assumption of local employees as members of one nation sharing similar work-related cultural values, this study attempts to investigate the relationship between National Cultural Values with obligation-based component of Organizational Commitment and Turnover Intention in the Maldivian context. For this purpose, the researcher conducts an extensive literature review of work-related cultural dimensions, organizational commitment, turnover intentions, and the associations among these three key constructs and eventually arrives at a conceptual framework to demonstrate the relationship among the key variables. Five concepts of National Cultural Values were established as independent variables, along with obligation-based component of organizational commitment and turnover intention determined as dependent variables. Accordingly, five hypotheses and five null hypotheses were developed for the aim of investigating the relationship among the constructs of the conceptual framework.

The research was coordinated through the Human Resources Departments of the four selected resorts. First, four resorts managements belonging to four different global regions were selected from the 46 foreign management resorts, in order to ensure the sample of representing a cross-section of the targeted population of locals working under international hotel chains operating within Maldives. Second, a total of 45 employees were randomly selected, including both executive and non-executive levels from each of the four chosen resorts. The researcher adopted a positivist quantitative method, facilitated through a questionnaire, designed to collect data at an individual level. The

instrumentation scales of each construct were adopted from theoretical foundations and validated models of previous studies, with the questionnaire designed on a five-point Likert scale system. In addition, Cronbach's alpha tests were conducted in order to assess the stability and consistency of measurements. Accordingly, data were collected from a sample of (N = 180) selected from local employees working under a South African, Asia Pacific, American and Middle Eastern managements. The study utilized both descriptive and inferential statistics to analyze the data. The software, Statistical Package for Social Sciences (SPSS) was utilized for data analysis, along with the Pearson-product correlations, with a cut-off point ($p \leq 0.05$) defined for correlation analyses.

In practical terms, the new findings of the relationship between work-related cultural values, organizational commitment and turnover intention of the study would prove beneficial, in particular, to employers of the Asian region, in understanding work-related values of employees, its association to their commitment to respective work organizations and eventually to decisions of remaining or terminating their jobs. Accordingly, the study provides an understanding of work-related values that would facilitate, especially foreign managements, in preparing strategies to retain their local employees. With most cultural research conducted on Western contexts, this study contributed to the knowledge body of cultural studies, specifically in the Asian region and particularly to the Maldivian tourism industry.

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An Analysis on the Destiny of Woman within the Repressed Social Realm Based On the Foremost Feminine Portrayals in Literature

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Abstract

The images of the 'feminine figures' which are reflected through the diverse socially and culturally created dimensions appear as fragmented bodies thus allowing the feminine self to be surrounded by the awareness of her nonexistence, the sense of lack of belonging and repressed individuality. Thus the study has focused on analyzing the female literary portrayals like 'Nora Helmer' in 'The Dolls House', 'Adela' in 'The House of Bernarda Alba', 'Emma Bovary' in 'Madame Bovary', 'Maggie Tulliver' in 'The Mill On the Floss' and 'Kattrin' in 'Mother courage and Her children', with the objective of bringing to the surface the socially determined fatal end and the symbolic disappearance of the feminine figure. Consequently the literary characters like Adela, Nora, Emma, and Maggie Tulliver portray the antagonism between the social principle of 'Repression' and the feminine 'Liberation'. In contrast to the characters such as Adela, Emma and Nora who negate the social other in pursuing their determined routes towards the self-satisfaction, the feminine portrayals like Kattrin and Maggie Tulliver adopt the self-denial and renunciation of desires for the betterment of the social other. Thus the characters like Nora, Emma and Adela become capable of gratifying their intense abomination towards the social order while Kattrin and Maggie Tulliver with their self-sacrifice and Altruistic motives achieve a serene satisfaction. In that sense it can be identified that their self-annihilation leaves behind a symbol of identity rather than nihilistic reality implying a more psychological vitality without being just a physical deterioration.

Author Keywords

Feminine figure, Repression, Liberation, Individuality, Self-annihilation

Introduction

Woman as a nebulous human figure who is segregated and devalued pertaining to her organic and social differentiation from the masculine self has to concede herself to be identified and defined as an embodiment of mythical, phallic and natural elements. Locating herself within the intersection of the negation and acceptance woman becomes incapable of realizing her true self and her actual essence tends to remain obscured. The repression of the woman (both physical as well as psychological) evolves narrowing down her identity and underlining her susceptibility in front of the authoritative appearance of the masculine figure. Thus she is thrown into a continuum of conflicts where her actions and reactions in the face of the imperative cultural dominance are viewed as valueless, nihilistic or destructive by the socially prejudiced perceptions. Whether she has pursued the dichotomous routes such as rebelling for her repressed desires or renunciation of her desires, the societal observations and the adjudications have defined their endeavours and the motives which lie beneath their deeds as irrational and illusory where the social justification and the acceptance lack. The social situation of the feminine figure where

she plays the role of the adolescent girl, young woman, married woman, divorced woman and a widow has forced her to remain under the societal fetters which are fortified by the religious, mythological and patriarchal concepts. Thus being incarcerated amidst the conflicting instincts within their own psychical texture and the inharmonious opposing perceptions between their own self and the authoritative cultural principles, the feminine characters strive with the passionate resolve to secure and empower their 'self' approaching towards their oases of liberation.

Experimental

The study focuses on analyzing the female literary portrayals like 'Nora Helmer' in 'The Dolls House' by Henric Ibsen, 'Adela' in 'The House of Bernarda Alba' by Federico Garcia Lorca and 'Emma Bovary' in 'Madame Bovary' by Gustave Flaubert, 'Maggie Tulliver' in 'The Mill On the Floss' by George Eliot and 'Kattrin' in 'Mother Courage and Her Children' by Bertolt Brecht with the objective of bringing to the surface the socially determined fatal end and the symbolic disappearance of the feminine figure. The fundamental concepts which are highlighted within the philosophical realms such as feminism and Psychoanalysis have been utilized in developing the analyzing process and the several studies that relate with literature, sociology and gender studies have been examined. Specifically in analyzing and elaborating the perspectives which are discussed within the research paper the theoretical perspectives of Simon de Beauvoir ('The second sex'), Sigmund Freud, ('Civilization and its Discontents',) and Slavoj Zizek, ('Looking Awry') have been referred with a thorough consideration.

The literary portrayals of women figures representing the social reality which is assigned to the feminine sphere address the unsolvable fictitious mystery which wraps her and infiltrates into her naturalness. Thus the feminine characters, ('Nora Helmer', 'Adela', 'Emma Bovary', 'Madame Bovary', 'Maggie Tulliver' and 'Kattrin') whose individuality and instinctual essence are repressed and attributed a nihilistic value, bring to the surface the socially determined fatal end and the symbolic disappearance of the feminine figure. Nora with the strict determination of doing the most sacred duty to one's self induces herself to become liberated from the dependence on Helmer with whose identification her 'self' is defined and recognized. Thus her independent departure and the resolution to find her true self are not viewed as a sincere effort with vitality, but as an undignified deed wrapped with insensitivity. Adela whose direct confrontation with the deeply-rooted social norms and the symbolic taboos makes her an abominable appearance in front of the authoritative order, has been negated with her anticipated survival. Pursuing the same tragic end yet encountering and witnessing another life trial, 'Emma Bovary' represents the victimization of the feminine figure within the demands and value system of the bourgeois social structure. During the journey towards the destination of her self-emancipation, Maggie Tulliver follows a path where the self-love is replaced by the compassion towards the social other whose emotional satisfaction and the survival become a source of spiritual victory in her life. Negating her 'self' and deviating from the self-centered objectives Kattrin embraces the role of the universal mother who possesses the potency of loving and considering children with the equal warmth of affection and sacrifices her life for securing the survival of the victimized children.

Nora, Adela and Emma accept their symbolic annihilation in resisting the perennial disturbance and repression which the 'power' of the masculinity imposes upon them.

Thus their revolutionary deviation from the prison shaped life whole, the family circle, turns out to be a narcissistic escape rather than a symbolic expedition towards the attainment of absolute emancipation. While they have been identified as the feminine figures whose anti-social endeavours and the pervasive ventures influence on the persistent patriarchal construction in endowing them with their anticipated emancipation, the approaches that Maggie Tulliver and Kattrin have adopted make them appear as another segment of feminine figures whose intentions and the efforts stand as self-determining in enhancing the well-being of the social other irrespective of the disparities and discriminations.

The literary characters like Adela, Nora, Emma, and Maggie Tulliver portray the antagonism between the social principle of 'Repression' and the feminine 'Liberation'. As the afore mentioned characters reveal, the feminine existence within those discriminated social structure becomes framed thus assigning them their self-denial. In contrast to the characters such as Adela, Emma and Nora who negate the social other in the pursuing their determined routes towards the self-satisfaction, the feminine portrayals like Kattrin and Maggie Tulliver adopt the self-denial and renunciation of desires for the betterment of the other. Consequently the characters like Nora, Emma and Adela become capable of gratifying their intense abomination towards the social order while Kattrin and Maggie Tulliver with their self-sacrifice and Altruistic motives achieve a serene satisfaction. In that sense it can be identified that their self-annihilation leaves behind a symbol of identity rather than nihilistic reality implying a more psychological vitality without being just a physical deterioration.

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Humanitarian Intervention into Domestic Jurisdiction on Genocide: Problems Encountered in International Law

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Abstract

Although armed intervention was not a legitimate practice, Genocide Convention pinpoints that intervention could be possible as follows, “the international community has the obligation to undertake to prevent and punish more actions beyond the penalties of who commit genocide”¹. The Fourth International Stockholm Forum on the Prevention of Genocide also talked about the possibility of using military or humanitarian intervention during armed conflict. But still the terms “prevention and punishment” (Hirsch, 2003) mentioned in the above cited statutes remain unclear, which is the main obstacle in legalizing humanitarian intervention. As genocide is underlined as a crime against humanity² and crime of international concern³, intervention becomes inevitable. This research paper analyzed the problems encountered in humanitarian intervention on genocide while placing solutions and recommendations at the end.

Author Keywords :

Genocide, Humanitarian Intervention, International Law

Introduction

Legalising humanitarian intervention on basis of genocide still faces problems remaining unchained even though the international treaties and statutory provisions governing genocide emphasize the gravity of genocide. The immediate need of preventing genocide which was created through numerous treaties such as Convention on the Prevention and Punishment of the Crimes Genocide, Nuremberg Charter 6 (c)⁴, Tokyo Charter 5 (c) and International Military Tribunal Charter⁵, is inattentive in the present situation. Two reasons are being mentioned for this preoccupied condition such as many of the terms or phrases (in the Convention and the Charters) are undivided and absence in a place to prosecute individuals committing genocide (Judith Derenzo, 2014, September 14) and these made the international binding treaty as a “forgotten convention” (Hirsch D. , Genocide Studies, 2003).

1 Article VIII of the Convention on the Prevention and Punishment of the Crime Genocide – “ Any contracting party may call upon competent organs of the United Nations to take such actions under the Charter of the United Nations as they consider appropriate for the preventions and suppression of the acts of genocide of any acts enumerated”.

2 Charter of International Military Tribunal Article 6 (b).

3 Convention on the Prevention and Punishment of the Crime Genocide 1948, Article 1”..... That genocide whether committed in time of peace or in time of war, is a crime under international law which they undertake to prevent and to punish.....”.

4 “Crimes against humanity includes Murder, extermination, enslavement, deportation and other inhuman acts done against any civilian population, or persecutions on political, racial or religious grounds, when such acts are 3 done or such persecutions are carried on in execution of or in connection with any crime against peace or any war crime”

5 Article 6

Renewed attention towards genocide prevention was gained through the establishment of ICTY (International Criminal Tribunal for Former Yugoslavia) and ICTR (International Criminal Tribunal for Rwanda) because the tribunal decisions had express jurisdiction over genocide⁶. Again the reincarnation on genocide prevention was made in post- cold war times including United Nations formed special courts for East Timor, Sierra Leone, and Cambodia (Hirsch H. , 2014, Volume 8). Many countries have adopted resolutions enticing people not to forget the Holocaust or the Armenian Genocides. Even the Countries with no law denials such as Canada also adopted such types of legislations known as “Ad Hoc Statutes” (Imbleau,). After the terrorist attack on September 11, 2001, the trend changed and “war on terror” became a burning issue rather genocides and other war crimes against humanity.

Humanitarian Intervention and State Sovereignty

Humanitarian intervention and military intervention have always been coined as ancillary principles since the treaty based genocide prevention began. Although armed intervention was not a legitimate practice, Genocide Convention pin points that intervention could be possible as follows “the international community has the obligation to undertake to prevent and punish more actions beyond the penalties of who commit genocide”⁷. The Fourth International Stockholm Forum on the Prevention of Genocide also talked about the possibility of using military or humanitarian intervention during armed conflict. But still the terms “prevention and punishment” (Hirsch, 2003) mentioned in the above cited statutes remain unclear, which is the main obstacle in legalising humanitarian intervention. As genocide is underlined as a crime against humanity⁸ and crime of international concern⁹, intervention becomes inevitable. This research paper attempts to analyse the problems encountered in humanitarian intervention on genocide while placing solutions and recommendations at the end.

Intervention whether it is based on military or humanitarian purposes is always considered as an opposing concept of the traditional international norm of sovereignty of the state. The Articles left obscured such as 2(4)¹⁰, and 2(7)¹¹ are the loopholes where the law deniers and critics find intervention is contrasting with sovereignty of a state. Article 2(4) strictly prohibits the “threat or use of force against the territorial integrity or political independence”. As territorial integrity and political independence are the main customs of sovereign principles, it could be argued that intervention is a breach of Article 2(4).

6 Articles 2-5 of ICTY Charter and Articles 2-4 of ICTR Charter

7 Article VIII of the Convention on the Prevention and Punishment of the Crime Genocide – “ Any contracting party may call upon competent organs of the United Nations to take such actions under the Charter of the United Nations as they consider appropriate for the preventions and suppression of the acts of genocide of any acts enumerated”.

8 Charter of International Military Tribunal Article 6 (b).

9 Convention on the Prevention and Punishment of the Crime Genocide 1948, Article 1”..... That genocide whether committed in time of peace or in time of war, is a crime under international law which they undertake to prevent and to punish.....”.

10 “All members shall refrain in their international relations from the threat or use of force against the territorial integrity or political independence of any state, or in any other manner inconsistent with the Purposes of the United Nations”

11 “Nothing contained in the present Charter shall authorize the United Nations to intervene in matters which are essentially within the domestic jurisdiction of any state or shall require the Members to submit such matters to settlement under the present Charter; but this principle shall not prejudice the application of enforcement measures under Chapter VII”.

But it only talks about integrity and political independence (John Baylis), and lacks the other two elements of population or government which are needed to be recognised as a sovereign state¹². Therefore intervention should not be taken as a breach especially during the crimes against humanity such as genocide or ethnic cleansing.

After the Cold War, sovereignty was questioned because legitimate collective interventions narrowed the scope of legitimate unilateral interventions. The countries of Non-Alignment Movement (NAM) uphold “humanitarian intervention” as a Western Concept and they are defending sovereignty through traditional interpretations. While unifying their debates against intervention they prefer two reasons as follow: 1) traditional rights of a state have been violated and 2) the rights of the inferring state are forcefully imposed. (W.Doyle, 2002). Though intervention breaches the sovereign principle, sometimes it has a recoiling effect of protecting sovereignty. This was experienced in Kuwait in 1990-1991 when Kuwait’s sovereignty was recovered by the “use of force” against Iraq by United Nations Security Council. It is unpreventable that interventions become essential when a state fails in its responsibility to prevent its own people during crimes like genocides. This idea was reflected in Kofi Annan’s statement over Rwandan Genocide: “a new international norm in favour of intervention to protect civilians from wholesale slaughter”¹³. (Annan, 1992).

Authorization in UN Level

Humanitarian intervention is expected to be authorized by United Nations Security Council to proceed in respect of Chapter VII of the United Nations Charter. As intervention concept remains as a Western value it is impossible with the Veto of Russia and China. This was sensed in NATO’s intervention into Kosovo (NATO justified the intervention in genocide, stating as “humanitarian war” to vindicate the “military necessity” (The Kosovo Report: Conflict International Responses, Lessons Learned , 2003)). The intervention was first considered as illegitimate as it lacked the authorization UNSC, but later the Security Council recognized it as legal after analyzing the positive impacts it made on Kosovo. This practice is not effective to implement intervention, and UNSC must find an alternative option to legalise humanitarian intervention in utmost situations. The interpretations of “use of force”¹⁴ can be made flexible during the threats of genocidal behaviour and terrorism, and other legislative interpretations of the Articles will give veto support of other P5 countries to make intervention permissible. Beyond this, considering

12 “.... The State as a person of International Law should possess the following qualification : a) a permanent population, b) a defined territory, c) government, and d) capacity to enter into relations with other states” – Article 1 of Montevideo Convention on the Rights and Duties of States.

13 “While the genocide in Rwanda will define for our generation the consequences of inaction in the face of mass murder, the more recent conflict in Kosovo has prompted important questions about the consequences of the action in the absence of complete unity on the part of the international community. It has cast in stark relief the dilemma of what has been called humanitarian intervention : on one side, the question of the legitimacy of an action taken by a regional organization without the United Nation’s Mandate : on the other, the universally recognized imperative of effectively halting gross and systematic violations of human rights with humanitarian consequences”. – Kofi Annan in his Annual Report to General Assembly in September, 1999.

14 The United Nations Charter Article 2(4).

the Articles 41¹⁵ and 43¹⁶, once UNSC decides on the matter of peace and security, all member states are required to support that decision and this can be strictly used to gain the support of the South world, and Non- Alignment Movement. (W.Doyle M. , 2002). Under the Uniting for Peace Resolution, the United Nations General Assembly is authorised to act in any event where UNSC cannot take steps against the threats of national peace and security. Using these alternatives, intervention could be made conceivable in serious international crimes. Humanitarian intervention could be possible on genocide if a universal jurisdiction is available over genocide crimes (A.Schabas). However it is more laborious, bestowing Israeli's high court's decision on Adolf Eichman's claim that "the province (Article 6¹⁷ of the Genocide Convention) was an obstacle to the exercise of the universal jurisdiction over genocide, and it was held that the despite terms of the Convention, exercise of universal jurisdiction was accepted only in customary international law (The Eichman Trial , 1960).

Recognition as a norm in International Law

Another difficulty faced in legalising intervention on genocide is humanitarian intervention is not yet expressly recognised as a norm in international law. The traditional international law permits such interventions which were often designed to help the suppressed. (W.Doyle M. , 2002). The traditional law also permits the interventions against state aid of rebels only when rebels had established a control of territory sufficient to be recognised (NICAJtAGUA v. UNITED STATES OF AMERICA), 1986). But participation of a rebel group cannot be always expected when genocide is conducted as "state-sponsored with the intention of destroying a certain ethnic group"¹⁸. The treaty based international law still faces fluxes to make way to intervention as a non-defensive use which is adequate the maintenance of peace and security. Though NATO's intervention into Kosovo had the justiciable reasons of "resource to war" and "lawfulness to conduct war" (The Kosovo Report: Conflict International Responses, Lessons Learned , 2003) for intrusion, it was rejected by the UNSC. This indicates balancing protecting people against force and international relations during intervention is a serious task. An argument on behalf of legitimacy was put, that if intervention includes an emergent framework of principled Humanitarian Intervention, but no treaty law ever talked about the framework or principled intervention since.

15 "The Security Council may decide what measures not involving the use of armed force are to be employed to give effect to its decisions, and it may call upon the Members of the United Nations to apply such measures. These may include complete or partial interruption of economic relations and of rail, sea, air, postal, telegraphic, radio, and other means of communication, and the severance of diplomatic relations."

16 "All Members of the United Nations, in order to contribute to the maintenance of international peace and security, undertake to make available to the Security Council, on its call and in accordance with a special agreement or agreements, armed forces, assistance, and facilities, including rights of passage, necessary for the purpose of maintaining international peace and security."

17 Article 6 of the Genocide Convention : "Persons charged with genocide or any of the other acts enumerated in Article 3 shall be tried by a competent tribunal of the State in the territory of which the act was committed, or by such international penal tribunal as may have jurisdiction with respect to those Contracting Parties which shall have accepted its jurisdiction"

18 "any of the following acts committed with intent to destroy, in whole or in part, a national, ethnical, racial or religious group, as such: killing members of the group; causing serious bodily or mental harm to members of the group; deliberately inflicting on the group conditions of life calculated to bring about its physical destruction in whole or in part1 ; imposing measures intended to prevent births within the group; [and] forcibly transferring children of the group to another group."- Article 2 of the Convention on Prevention and Punishment of Crime Genocide.

Political Will

Political will is one of the struggles faced by the international community to encourage intervention to prevent crimes against humanity. It can be divided as the political will based on national interest and lack of political will to intervene. Throughout Cold War, intervention was handled as a diplomatic policy to gain self-interest with the validation of humanitarian crisis possibly including genocides (Greenwood, 2002). French intervention in Rwandan genocide was obviously an abuse, as France sent its troops at the last moment after 800,000 people got killed (John Baylis). This is one of the reasons that the claims of intervention fail to earn support among the Member States of United Nations. Currently the condemnations regarding Western policies such as “the battle to stop genocide has thus been repeatedly lost in realm of domestic politics” (Power, 2003) are increased.

In conclusion, although intervention lacked its importance as a practised international norm, and shares some negative criticism, it can be used as an effective tool to prevent crimes against humanity. The denials of intervention are accepted mainly within the framework of United Nations Charter. Since 1945, human rights were given a subordinate and marginal role in the UN system; it's an international responsibility to make intervention permissible when human rights are violated in genocides. The problems above mentioned such as continuous instabilities on humanitarian intervention over sovereignty of state, the authorization of UNSC as an essential requirement, absence in international law, and political will can be solved if they are approached in a right manner.

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NATO and New World Order

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Abstract

This research paper examined how North Atlantic Treaty Organisation can be transformed as an alliance of conflict-resolution and crisis management confronting the challenges, criticisms faced, and the new strategic concepts that the alliance recently adapted especially after the Wales Summit 2014. Furthermore, stressed the necessity for the alliance to change its core value from “collective defence to “crisis management”, the relationship with fragile states, its brand new policy for emerging Russia and its response over combating terrorism and how these will boost NATO to adopt itself for a new atmosphere and bring new world order.

Author Keywords

NATO, Collective Defense, Crisis Management, New World Order

Introduction

Since the end of Cold War, the United States along with its alliances sensed the importance to create a collective security channel to prevent further threats from other states. This initiative created through North Atlantic Treaty in 1949 known as NATO. The objective of this strategy is to maintain collective security among the parties and capacity building to prevent further threats. But, in the recent years, the reason for the transformation at NATO is sensed particularly by two reasons. The first one is, the nature of the threats have changed from military attacks to terrorism, acts against humanity and cyber-attacks, but on the other hand the restriction drawn by the treaty to expand its alliances and strategies to face new challenges. The purpose of this essay is to examine the need for the transformation at NATO. Further, this essay proposes the modification needed at NATO to prevent further risks.

Crisis Management – a better option

NATO holds collective defence and co-operate security as its core values with the purpose of implementing Article 5 of the Washington Treaty of NATO¹, and Article 51 of United Nations Charter. NATO is only permitted to implement collective defence within its periphery- North Atlantic Region. Nevertheless, using collective security in broader level by referencing UN Charter will question the limit of NATO because an alliance is defined as “a group of nations decide to defend a specific territory” (Kissinger, Does America Need Foreign Policy ?, 2001). United Nations’ collective security system should be a judicially neutral one, not a territorial defence system. Therefore, when an

1 Article 5 of the Washington Treaty – “The Parties agree that an armed attack against one or more of them in Europe or North America shall be considered an attack against them all and consequently they agree that, if such an armed attack occurs, each of them, in exercise of the right of individual or collective self-defence recognised by Article 51 of the Charter of the United Nations, will assist the Party or Parties so attacked by taking forthwith, individually and in concert with the other Parties, such action as it deems necessary, including the use of armed force, to restore and maintain the security of the North Atlantic area.”

international community like UN has some obligations, a country or a group of countries cannot intervene. But NATO is not just an alliance according to Wilsonian idea², it is a powerful institution formed to make international order. Implementing UN Resolutions is a significant norm (Rosenau) for achieving global order. Therefore, it would be better to focus on Crisis Management³ rather than collective defence or security to meet the new challenges of post-Cold War world. This will help NATO to gain transformation and redefinition of its mission and purposes.

Another reason for adopting crisis management as a better option is, creating a Global Security Hub is practically impossible as it has some obstacles. Though NATO is a powerful organisation, the amount of membership it possessed is lower when comparing to other international and regional organisations such as CSCE (57 members) Latin Union (36 members) Council of Europe (47 members) and African Union (53). This is considered as a real fall back for NATO in achieving collective defence and co-operate security. The defined peripheral boundary prevents the alliance to expand the collective security. If NATO welcomes states out from its transatlantic (North Atlantic Region) territory, this would be controversial to Washington Treaty which states “any European state in position to further the principles of this treaty and to contribute to the security of NATO. Therefore, crisis management will be an alternative and better option especially in maintaining relationships with other international and regional organisations. Global Order of Twenty First century includes establishing and maintaining peace on a regional and global level (Rosenau). Contacts with organisations⁴ than member states will help NATO to give wider set of opportunities for people and even states to participate in the decisions that make New World Order⁵.

Making suitable peace-making strategies

Additional realisation that the NATO Leaders gained from the discussion in the summit 2014 is that peacekeeping is also tough as peace making. They also realised if the world should enjoy expanded security, it would be possible only by ensuring individual's freedoms. Maintaining stability and peace in Afghanistan is still hard for the Allies, therefore Wales Declaration called all the member states to co-operate in solving the domestic problems of Afghanistan before next year with the help of special International Security and Assistant Force⁶. NATO's special acts regarding instigating democratic values, rule of law, human rights and political stability in Afghanistan will be helpful to Afghanistan to emerge as an established state as “growing young democratic nation” (Pinter) in short-terms but it will cause Afghanistan to be dependent on NATO Allies after

2 The Wilsonian idea of an international order based on a common devotion to democratic institutions and settling its disputes by negotiations rather than war has triumphed among the nations bordering the North Atlantic (Kissinger, Does America Need Foreign Policy?, 2001)

3 Article 4 of the Washington Treaty – “The Parties will consult together whenever, in the opinion of any of them, the territorial integrity, political independence or security of any of the Parties is threatened”, and Article 43 of the United Nations – All members of United Nations in order to contribute to the maintenance of international peace and security, undertake to make available to the Security Council.

4 The Wales Declaration reflected this in many Articles such as 27 (Organisation for Security and Co-operation Europe – OSCE), 39 (African Union), 70 (European Union), and 87 (Gulf Co-operation council, and Arab League).

5 “NATO is the best protection against military blackmail from any quarter: The European Union is an essential mechanism for stability in Central and Eastern Europe.” (Diplomacy)

6 Article 41 of the Wales Declaration

a long term period. It will question the recognition of Afghanistan as a state in future, as Afghanistan's dependency may not help to form an effective government or capacity to enter into legal relationships. Sovereignty of a state is inevitable to keep its position in international arena, but NATO still wants to intervene into Afghanistan's domestic affairs and even plans to send special troops to train Afghan soldiers with the purpose of keeping Afghan military power on their direct observation. This will be condemned in future if NATO continues this approach in other states which earned NATO's attention nowadays such as Libya, Kosovo, Georgia and Republic of Moldova⁷. In addition, the interference into domestic affairs of other states in favour to universal humanitarian and universal justice will be considered in contradiction of Westphalian principles⁸, which shaped the international relationships today.

The relationships with Russia

Demonstrating Russia as an integral part of New Europe security will be a key for World Order because the isolation of Russia will spoil the democratisation in Russia and its neighbourhood countries. Perhaps, NATO's transformation from "collective defence"⁹ to "crisis management"¹⁰ like above mentioned will defuse Russia's anxieties about the isolation and prevent the crisis with Russia. At the same time if the growing military encirclement of Russia letting in Baltics, Ukraine, Georgia, Azerbaijan and some new states of Central Asia ever lasts it would be measured as a recall for NATO's remilitarization. It was noticeable that the alliance gave more priority to maintain flexible affiliation (Clinton B. , 1997) through "decorative and strategic partnership and friendship" (Stephen.F.Cohen, 2007/08) with Russia in Nineties¹¹ but the alliance diplomatically failed to maintain that¹². Considering that, NATO now believes the change of leadership¹³ will result good outputs to renew the healthy relationship with Russia and reduce the Russian fear towards NATO's expansion of Western capitalism.

In conclusion, the final form of world order is unpredictable because its elements face a constant flux. The elements cannot be clearly defined. However, the most common features of Twenty First century world order are collapse of communism, splintering of Soviet Union, UN Resolutions, collective interest, preservation of democratic values, and equitable distribution of resources (Rosenau). If NATO follows these principles, it would fulfil the Wilsonian Dream of international order. From the past years, the alliance faced many criticisms regarding its failure of vision and leadership especially the failure to response for the threatening from Moscow. America is considered as the supreme power of the alliance, indirectly stated one thing before the summit that, "if the alliance

7 Article 38 and Article 39 of the Wales Declaration speak about ensuring Libya's membership in Mediterranean Region.

8 Treaty of Westphalia 1648- Principle of Non-Intervention.

9 Article 5 of the Washington Treaty of NATO.

10 Article 4 of the Washington Treaty of NATO.

11 "Old NATO was basically a mirror image for Warsaw impact and no erasing lines to be concerned"- 1997 – Bill Clinton in joint Press Conference with Russian President. Formation of NATO- Russia Founding Act in 1997 May 27th signed between President Bill Clinton and Russian President Boris Yeltsin.

12 Anders Rasmussen's (Former Secretary General NATO), Deterrence and Defence theories against Russia for the past five years , changed the possibility of reconciliation with Russia.

13 Anders Fogh Rasmussen was replaced by Jen Shaltenperg for the Secretary-General post of NATO.

fails to reach its goals, the individual member states of NATO will take the power" (Herbst) which means that America expects the full support of the member-states or else it would act individually. When we see the traditional world orders of the history, we could spot that the time duration has been shrinking and they emerged and ended in a particular place, not worldwide (Kissinger, 1994). Unlike them, the Twenty First Century world order must include wider periphery and must last for a longer period. It should be included with "enlarging democracy" (Clinton, 1993), and partnership based on consultation and cooperation (Bush, 1990). Therefore, NATO is considered the only and suitable remaining agency, which has the capacity of making "World Order" with partnerships and diplomatic strategies beyond Western phenomenon.

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A critical analysis of the issues in implementing International Humanitarian Law in respect of the international and non-international armed conflicts

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Abstract

International humanitarian law is the substratum of modern Human Rights law and modern international law including civil, political, cultural and economic aspects. Basically, it is the law or rules and regulations that are applicable in international or non- international armed conflict. International humanitarian law can be traced back to the eighteenth century and it was properly codified by the United Nations in nineteenth century with the comprehensive support of International Committee of the Red Cross. Since the birth of international humanitarian law, it has deviated from its own parameters and standards which already exist owing to the facts and circumstances that have not yet been identified.

The misconception or the concept of denunciation in relation to international humanitarian law has increased over the last twenty years with reference to these implications. Specially, international humanitarian law is limited to a state own territory in relation to the domestic law because most of the countries, without concerning its policies on monism or dualism are reluctant to confer their consent towards international humanitarian law. Even though the violations of international humanitarian law are always brought to the limelight by the international and domestic media and publications, it is unfortunate that its contributions are not always highlighted. Moreover, there is no effective mechanism under the public international law to circumvent the violators of the international humanitarian law and hence this aspect of International humanitarian law calls for further discussion in order to avoid such misconceptions.

Author Keywords

Humanitarian Law, Public International Law, United Nations, International Committee of the Red Cross, Monism and Dualism, Geneva Convention

Introduction

The main purpose of the international humanitarian law is to build up tremendous pressure on personal liability in respect of war crimes. The Geneva Conventions play a major role in this regard and former criminal Court in Hague and criminal tribunals for Yugoslavia and Rwanda has effectively applied the relevant Geneva Convention thus contributing towards the development of international humanitarian law. Laws and customs of war are usually overpowered by the military interests. It constitutes the worst risk and damage on the extension of international humanitarian law. Today, most of the armed conflicts are non-international in nature and it is observed that there is discrepancy in the application of the existing body of the rules and regulations. Hence many rules drafted and implemented for the purposes of international armed conflicts are applied under the same condition for non-international armed conflicts with the expediency of

customary international law. This area however is not developed and codified properly. Several attempts have been made by the relevant international authorities including international committee of Red Cross to produce comprehensive customary rules which are applicable in non-international armed conflicts but all of these rules have not yet been internationally accepted or recognized and the scope of application of aforesaid rules therefore is debatable. The worst experiences of the Second World War were assimilated by the 1949 four Geneva Conventions and International humanitarian law although, has dealt with those worst situations, no positive results were created subsequently in respect of the human rights violations during the second World War.

However, International Humanitarian Law is based on the supposition that equal parties battle each other but it contradicts with the realistic application. Further, in certain incidents the stronger party of the war may violate the laws and customs without any concern on their own soldiers, hostages, prisoners and the civilians of the particular area that fall victims to an infringement of international humanitarian law and weaker party of the war could see its only way to overcome the other party's strength by taking recourse to illegal methods. Infringements of the laws and the customs of war then lead to military advantages and as such result in inter alia drug trafficking, money laundering and human trafficking. Vast asymmetries of military capabilities have characterized and influenced the modern armed conflicts anonymously under the international or non-international level. Also criminal responsibility in reference to the personal and state are not identified properly by the international humanitarian law hence, those areas are still unanswered. Therefore it is noticed that these types of asymmetries of the warfare can be identified giving rights to such defects in international Humanitarian Law.

Another defect in the international community is the impact of modern warfare on International Humanitarian Law. The definition or the meaning of status groups in international Humanitarian Law confronts the international community with contemporary problems, too. Some States strongly believe that the international humanitarian law go against their vital internal policies, principles and laws hence some contradictions and conflicts do arise as a result. For instance the rights granted to the prisoners of war and hostages under the third and fourth Geneva Convention are considered inconvenient and during an armed conflict these rights are usually infringed by the parties to the conflict. Further, dissemination of international humanitarian law was neglected and prevented by the states and the governments over last few decades gradually. In order to avoid respective duties and liabilities under the international Humanitarian Law sometimes parties to a conflict specially state parties simply give different interpretation to the relevant definitions and terms. States tend to resort to public international law regime in order to justify their action during the combat period thus substituting international humanitarian law with public international law.

One of the leading principles and policies in international humanitarian law is the duty to differentiate civil and military targets and not to attack the former but these principles have limited application in actual armed conflict situations. Furthermore both under the international or non-international armed conflicts it is crucial for combatants and participants to be aware of the applicable law in such situations. Such lack of knowledge on the law can be attributed to less developed judicial infrastructure. Also lack of knowledge can also be attributed to the fact that state and government authorities

look at the international humanitarian law as a burdensome duty rather than a moral or honorable commitment. Therefore the most basic requirement of implementing and applying international Humanitarian Law is the knowledge of the law itself.

Conclusion

It is concluded therefore considering the universal practice one should observed that the recent concept such as just war gain creeping renaissance due to above referred defects in international humanitarian law. At the present several international armed conflicts take place in various countries and places that lead to the establishment of governments which supported by United States or for furtherance of their own desires such as religion. In these circumstances the international humanitarian law becomes inapplicable due to undue influence of countries such as United States. For instance most of the humanitarian laws were not applicable in Afghanistan and Iraq and special advantages of such inapplication was partaken by United States and these contemporary issues continue to go increased because of the poor and lethargic implementation of international humanitarian law in armed conflicts. Predominantly the great powers never have been concerned at seeing their capacities, powers and capabilities to act restrict the application of the principles in relation to the prohibition of the threat or use of force. The underlying dilemma to all of the aforementioned defects is the increasing acceptance of war as a means of law enforcement but at the same time critical parameters of international humanitarian law have not provided any constructive solutions on these defects and vice versa it reflects the existing defects of the principles of international humanitarian law.

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Migrant domestic workers and the legal protection offered to them

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Abstract

Due to poor economic situations, many women travel abroad to work as domestic workers. While some of these workers are treated well by their employers, the majority of workers are subjected to many hardships and return empty handed. There are many agencies that are in place to ensure that the migrant workers are protected and not exploited. A number of laws and bilateral agreements are in place to protect and to prevent the exploitation of domestic workers. However whether they are properly implemented within the respective countries is questionable.

Author Keywords

Female migrant domestic workers, Abuse, Legal protection

Introduction

In Sri Lanka one of the most important but vulnerable group of workers are the female migrant domestic workers. Most workers work on low pay for long hours and are susceptible to many forms of harassment and abuse. Over 125,000 Sri Lankan women migrate to the Middle East as domestic workers each year (Human Rights Watch, 2007). Their earnings have made a significant contribution to the Sri Lankan economy. The most compelling reason behind the decision of many women from the lower income section of society to migrate is the financial necessity.

Abuse faced by migrant workers at the work places

The abuse takes many forms, from physical, psychological to sexual abuse. The most common methods of abuse were verbal and physical harassment. These include deprivation of food, rest/sleep, not allowing any form of communication to anyone outside the employer's family, beatings, deliberate burning with hot irons, and hair-pulling etc (Human Rights Watch, 2007).

Laws applicable to Migrant workers

The Sri Lanka Bureau of Foreign Employment is the foremost government body that deals with migrant workers. The Bureau established the institutional mechanism to regulate the recruitment of Sri Lankans for employment abroad. The National Labour Migration Policy for Sri Lanka, developed by the Ministry of Foreign Employment Promotion & Welfare was approved by the Cabinet in 2010. This National Labour Migration Policy aims to promote opportunities for all men and women to engage in migration for decent and productive employment in conditions that ensure they have proper freedom, security and work with dignity. The National Advisory Committee on Labour Migration was established in 2010 to deal with issues of migration in a systematic manner (Jayatilaka, 2008).

International Convention on the Protection of the Rights of All Migrant Workers and Members of Their Families (1990) was acceded to, by Sri Lanka in 1996. This provides for, freedom from torture, slavery and other such rights for migrant workers. The International Labour Organization Convention on Forced Labor No. 29 (1930) has been ratified by Sri Lanka, Saudi Arabia, Kuwait, Lebanon, and the UAE. The aim of this convention is to put an end to forced labour (Jayatilaka, 2008). The government of Sri Lanka has signed four Memorandums of Understanding (MOUs) with UAE, Jordan, Qatar and Bahrain to ensure the protection of and securing the rights of Sri Lankan workers, particularly women workers (Caritas Sri Lanka, 2011).

Conclusion

There are many agencies and a number of laws and conventions in place to ensure that migrant workers are protected and not exploited. However the extent to which these theoretically proper writings are put in to practice is questionable. Even though certain Middle Eastern countries, such as Saudi Arabia are signatory to international conventions that prohibit slave like working conditions for women, there does not seem to be proper practical implementation. More Memorandums of Understanding and bilateral agreements need to be created and properly implemented between Sri Lanka and host countries to ensure the safety of migrant workers. It is clear is that there are a significant number of laws, conventions and institutes created to protect the welfare of migrant domestic workers. However, the problem lies in the complacency of the law enforcement mechanisms ensuring that the proper procedures are followed. Therefore it can be concluded that the laws in place for the protection of migrant workers are adequate up to an extent, but the implementation needs to be stronger and more assertive.

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A Critical Analysis on ‘Hybrid Courts’ as an effective mechanism to achieving transitional justice

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Abstract

Recent years have seen a proliferation of hybrid courts as a mechanism to achieving transitional justice in post –conflict contexts. As such, in order to facilitate the process of reconciliation in war-torn societies hybrid courts are created to prosecute the offenders of international criminal law. These courts are referred as ‘hybrid’ because they comprise of a blend of international and domestic laws. Transitional justice on the other hand is a process by which states become more accountable and provide reconciliation mechanisms for past atrocities and violations of human rights. Transitional justice is seen as a key to more peaceful and democratic social order. Rwanda, Sierra Leone and Lebanon inter alia are states where international courts were established to prosecute international criminal offenders. The rationale for creating such hybrid courts depends upon the circumstances of individual state. Much has been written about the Hybrid courts, it is important however to ponder if hybrid courts can be used as an effective mechanism to achieve transitional justice where its conceptual advantages and disadvantages need to be compared against that of other international mechanisms. It is important to further explore the viability of hybrid courts because they continue to attract less importance despite increasing discourses on transitional justice. It is therefore important to subject its advantages and disadvantages to substantial analysis in order to consider if hybrid courts would be an effective mechanism to achieve transitional justice.

Author Keywords

Hybrid courts; transitional Justice; ad hoc tribunals; retributive justice; international criminal court; Rome Statute;

Introduction

In the recent past Hybrid Courts have been widely discussed of, as being an important mechanism to achieving transitional justice in post–conflict situations in order to facilitate the process of reconciliation. The rationale for hybrid courts inter alia are the lack of capacity or resources at the national level, fears of bias or lack of independence in the legal system, contributions to the right to justice and an effective remedy, contributions to ending a culture of impunity and contribution to reconciliation. (Office of the United Nations High Commissioner for Human Rights, 2008)

Transitional Justice is generally referred to as one of the important aspects in the peace-building process in countries that have been affected by war. The countries that have gone through such atrocities need to transform the society into a democratic society where the law rules and justice prevails. In the circumstances, countries that have undergone such atrocities need to implement measures to achieve such transformations in a way that it prevents recurring of conflicts in the future.

The components of transitional justice are generally identified as justice, reparation, truth and institutional reform and the process of transitional justice seems to be based on three main propositions namely, that the international law paradigm obliges states to investigate, prosecute and punish such crimes, that adequate reparation under international law includes bringing perpetrators to account and that the accountability for past crimes is crucial to prevent such atrocities in the future (Clara, 2010). Given, incompatible different political forces and goals that prevail in a society during such periods of social change, the mechanisms of transitional are not always based on consistent normative foundations (Bell, 2009)

This work does not however intend to explore the broader and complex aspects of the concept of transitional justice, rather the structural and theoretical advantages and/or the disadvantages of Hybrid courts by focusing mainly on the theoretical justifications and the strengths and weaknesses of the Hybrid Courts. This aspect of Hybrid Courts will be further analysed in relation to the situations that prevailed in East Timor (the Serious Crimes Panels of the District Court of Dili), Kosovo ("Regulation 64" Panels in the Courts of Kosovo), Sierra Leone (the Special Court for Sierra Leone) and Cambodia (the Extraordinary Chambers in the Courts of Cambodia).

Methodology

The study of this research is analytical and qualitative in nature and seeks to critically analyse the structural and theoretical justifications of the hybrid court system in reference to the above referred countries. In order to achieve the above said research objective, analysis of the existing literature will be used. All relevant academic literature in relation to Hybrid Courts will be analysed in order to ascertain to what Hybrid courts serve an effective mechanism to achieving transitional justice.

Conclusion

The role and function of hybrid courts would be not only to prosecute the perpetrators of mass atrocities but also to prevent such atrocities occurring in the future, as such it is submitted that it should not be limited to achieving retributive justice. Establishing of Hybrid Courts therefore should be for the wider purposes of deterring potential future perpetrators. Furthermore, it is noted that the need for Hybrid Courts emerge when there is insufficient domestic mechanisms to try the offenders. In such circumstances it is noted that the entire domestic legal system will be benefited by the jurisprudence of such Hybrid Courts that are properly established.

A tribunal may be hybrid in its origin, its mandate or its composition (Elizabeth.M). It is also important to consider to what extent such Hybrid Courts will be compatible with the domestic legal systems and would therefore be of importance to explore the extent to which it would be beneficial to involve the members of the civil society.

It is further submitted that in addition to such Hybrid Courts, by developing ad hoc tribunals, the international humanitarian law ensures that the perpetrators of such blatant violations of human rights are prosecuted. The focus of this paper would only be the structural and theoretical justifications of the Hybrid Court systems that may be used to secure transitional justice. It would also of importance to note that the International Criminal Court was established by the Rome Statute, 1998 and it came into force in the

year 2002. The International Criminal Court has jurisdiction to hear matters pertaining to crimes against humanity, war crimes, genocide and the crime of aggression. The Hybrid Courts on the other hand demonstrates an important development in this respect making perpetrators of such crimes accountable within the domestic jurisdiction.

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White Collar Crimes - The Collapse of the Wall Street Darling, Enron

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Abstract

Financial Crimes are the crimes which involve some person or an organization which takes the money or property of people and use them in an illegal manner in order to make a personal gain. These are recognized in the business world as 'White Collar Crimes' since such crimes are committed by popular business professionals by using their popularity and trust in the business world. According to the Interpol these white collar crimes are always international and it does not just stop with affecting one or few persons but affects many people, entities, companies, and stretches to even affect economies at large. They become a threat to the development and stability of economies bringing in a lot of problems such as unemployment, loss of savings, reduction in investments and loss of confidence in the financial system of an economy.

Financial crimes affect private individuals, companies, organizations and even nations, and have a negative impact on the entire economic and social system through the considerable loss of money incurred. This research seeks to identify such white collar crimes, how they have been committed and what the law has done in order to address such issues. This research will also enable to bring out means and methods to address these issues. Focus will be brought on one of the largest financial crimes committed in the history which was the Enron collapse.

Introduction

Financial Crimes are the crimes which involve some person or an organization which takes the money or property of people and use them in an illegal manner in order to make a personal gain. These are recognized in the business world as 'White Collar Crimes' since such crimes are committed by popular business professionals by using their popularity and trust in the business world. According to the Interpol these white collar crimes are always international and it does not just stop with affecting one or few persons but affects many people, entities, companies, and stretches to even affect economies at large. They become a threat to the development and stability of economies bringing in a lot of problems such as unemployment, loss of savings, reduction in investments and loss of confidence in the financial system of an economy.

Financial crimes involve crimes such as Money laundering, antitrust frauds, Bankruptcy fraud, Bribery, Computer fraud, credit card frauds, insider trading, securities fraud, trade secret fraud etc.

A financial crime is any non-violent offense that is committed by or against an individual or corporation and results in a financial loss. When a financial institution is involved, the crime is referred to as a financial sector crime. Tax evasion, embezzlement of company funds, and the sale of fictitious insurance plans are just a few examples of financial crimes, while money laundering, credit card fraud, and check fraud are all instances of

financial sector crimes. Most white collar crimes are classified as financial or financial sector crimes.

Although most financial crimes are felonies that carry harsh sentences, such crimes are becoming increasingly common: in 1998 alone, more than 300,000 people were arrested for financial fraud, while in 1999, roughly one-third of Americans fell victim to some type of financial or financial sector crime.¹

Financial crimes affect private individuals, companies, organizations and even nations, and have a negative impact on the entire economic and social system through the considerable loss of money incurred.²

An important section in financial crimes is the creative accounting. This involves using the loopholes which are available in the relevant accounting standards and exploiting them in order to show a favorable financial statement to the stakeholders. This is not illegal always but the repercussions of such an action could lead to financial crimes. Accounting practices that follow required laws and regulations, but deviate from what those standards intend to accomplish. Creative accounting capitalizes on loopholes in the accounting standards to falsely portray a better image of the company. Although creative accounting practices are legal, the loopholes they exploit are often reformed to prevent such behaviors.³

Experimental

This Research will focus on the ways and means which Creative Accounting has been used in order to commit fraud at the Enron Corporation. Attention will be made on the Accounting Standards which were misappropriated and the loopholes of Accounting which were exploited by the Management of the Enron Corporation and its Auditors the Arthur Anderson.

Analysis of the weaknesses which were present in the Financial Reporting Standards existing at that time will be laid out while further analysis will be made on the Laws and Regulations which were brought about following the collapse of businesses like Enron etc.

Attention will be made to the existing International Financial Reporting Standards (IFRS) which are in use currently and the loopholes which exist in them too.

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EMERGING TRENDS

Identify and analyse the impact of Mergers and Acquisition on operational performances and shareholder wealth - (Case study on Aviation and Banking sectors in India)

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Abstract

The Sri Lanka post war, designed its economy in order to achieve a high level of economic growth to expand the country. The previous government had planned to introduce the emerging strategic concept, Mergers and Acquisition to enhance the economy by increasing the capital asset of the firm. The initial stage, the government planned to merger the smaller commercial banks with banks with high reserves and assets base in order to introduce at least five banks with more than 100 billion US\$ reserves. The obligations and the merging constraints, the concept was not able to implement in Sri Lankan banking sector.

The research mainly concerns on the banking and the aviation sectors in India, which introduced Merger and Acquisition as a strategic tool to enhance the overall performances and the shareholder wealth. The financial analysis of the pre-merger and the post-merger demonstrate the performances and the shareholder gaining of the acquiring firm. The relevant and the specific in depth analysis would provide a platform to understand the milestones of the mergers and acquisition in India and to identify the strategic issues in Sri Lankan context.

The overall research examined that beyond the financial analysis the companies have different synergies in the form of increase the customer space, expansion of geographical expansion, increase the overall size of the company, entering in to the new markets, and reduce the overall operational cost.

The research has concerned a major aspect of the M & A in order to analyze, compare and contrast the operational performances and the shareholder wealth in different sectors to understand the strategic complexities in Sri Lankan context.

Author Keywords

Mergers and Acquisition, Operational Performances, Shareholder wealth, Pre-merger, Post-merger

Introduction to the Research

The present market focus on the profits and the shareholders wealth and the organizations define different strategies to achieve the targets. The marketing and the business development can define as conventional methods and in the case of global expansion, the constraints of the local customers, domestic regulations and rules play a major role. In order to face the challenges in the global market, setting up new markets, or invest or buy outright market develops new market interests.

According to Ghosh and Das, 2003, the internal growth can achieve through new product and development (NPD) and the external growth can achieve through merges and acquisitions. The deregulation, privatization, globalization and liberalization have a direct impact on the merges and the acquisitions.

The foreign companies have developed their confidence and the ability to finance and execute through equity acquiring, and invest on a business which is establish. The concept of M & A define as a strategy of expansion of the product portfolio, new market entrants, access to resources and to reach the global scale for the company. (Yadav and Kumar,2005). The Roll, 1986 define M & A as a strategy in order to maximize the portfolio and build up the corporate image. The automobile, telecom, aviation, banking and oil industries in the world have used M & A as a consolidated strategy in order to maximize the profits and create a shareholder wealth. The M& A have added values to acquiring firm as well as the target company, shareholders, customers and the society at a broader scale.

The M & A can have an impact on the share price in the market and the investigations have proved that shareholders wealth maximization plays a major objective in the concept. The rise or the fall of the share price ultimately leads to the shareholder wealth of the organization. Hitt, Ireland and Hoskisson, 2005 define M & A as a concept of projecting the financial status of the organization relating the increase or the decrease of the share prices of the organization with M& A.

The M & A is an appropriate strategy in order to enhance the shareholder values, performances, and market competitiveness. The company needs to evaluate its corporate strategy and identify the feasibility of the application of M & A. Schweiger, 2003 stated that two third of the organization who enters in to M & A fails in the later stage it leads to deteriorate the wealth of the shareholders.

The Aim and the Research objectives

The Aim of the Research

Identify and analyze the impact of mergers and Acquisition on the operational performances and the shareholder wealth in Indian banking and Aviation sector

The Research Objectives

- To identify the corporate strategic back ground for the M & A in Indian Banking and Aviation sector
- To analyze the pre M & A operational performances and the shareholder wealth in Indian Banking and Aviation sector
- To critically analyze the impact of M & A on operational performances in Indian Banking and Aviation sectors
- To strategic evaluation of the shareholder wealth in post M & A in Indian Banking and Aviation sectors
- To identify the key operational complications of the M & A process
- Recommend to develop an effective M & A strategy for the Sri Lankan Banking and Aviation sector

Research Methodology

Research Design

The research design would be first the descriptive research design. The descriptive research design provides concise and the specific information on the research and the data analysis is logical, factual and simple. The research would conduct in an Indian scenario and to analyze the impact of M & A on the overall performances and the shareholder wealth.

The Aviation and the Banking sectors would be selected in India for the study and under each sector two companies will be analyzed. The research objective would be to identify the impact of M & A, and therefore the performances and shareholder wealth in pre-merger and the post-merger time period would be used. The shareholder wealth and the performances would analyze based on the financial analysis of the companies 2 years for pre-merger, during merger and the post-merger. The Operational Profit Margin, Gross Profit Margin, Net Profit Margin, Return on Capital Employed, Return on net worth, Debt –Equity Ratio, EPS and PE would use as operational performances and shareholder wealth analyzing indicators.

The data of 8 companies need to describe, analyze and investigate, the exploratory research design cannot be applied, and therefore the descriptive research design would be used. The research process would investigate the impact of M & A on the operational performances and the shareholder wealth.

The research focus on the M & A in Avian and the Banking sectors in India. Four companies will be selected from each sector and the impact of M & A on the operational performances and the shareholder wealth will be measured for four companies. Total 8 companies would be analyzed and 4 companies are acquiring companies and the 4 companies are target companies.

The merger between Kingfisher Airline - Air Deccan and Jet Air ways- Air Sahara would consider in Avian Industry. The merger between HDFC - CBOP (Centurion Bank of Punjab) and OBC (Oriental Bank of Commerce) - GTB (Global Trust Bank) would consider in the Banking industry.

Conclusion

The present market focus on the profits and the shareholders wealth and the organizations define different strategies to achieve the targets. The marketing and the business development can define as conventional methods and in the case of global expansion, the constraints of the local customers, domestic regulations and rules play a major role. In order to face the challenges in the global market, setting up new markets, or invest or buy outright market develops new market interests.

The M & A is an appropriate strategy in order to enhance the shareholder values, performances, and market competitiveness. The company needs to evaluate its corporate strategy and identify the feasibility of the application of M & A. The corporate strategy guides the value of business units, organizational directions, goals, business portfolio, resource allocation and the growth plan to the organization.

The conclusion is that the M & A as a strategy cannot create immediate shareholder wealth and the operational performances and it can define as a long term strategy. Therefore, M & A define as a strategy to cope up with the high level of competition, to reduce the overall operational cost and cope up with the dynamic business environment. The studies have been conducted in order to identify whether M & A can creates shareholder wealth and can enhance the overall operational performances of the bidding and the target company. According to the research conducted by Surujit Kaur, 2002 of 20 companies from 1997 to 2000 stated that acquiring firm was not able to create significant shareholder wealth based on the financial analysis. The studies conducted by Beena, 2004 supported the findings of Surjit Kaur, 2002 and further stated that in manufacturing industry, the M & A was not able to create shareholder wealth and profit maximization. According to the research conducted by Ghosh, 2002 , stated from the sample of 140, between 1985 to 1999, the return was -0.95% and the same result was obtained by Mulherine and Boone, 2000 from 20 companies, the return was -0.36%. These research studies demonstrated that the post- merger performances have been negative on the acquiring company and these studies had concerned on the gas, steel, finance, aviation and the banking sector specifically.

The conclusion is similar and supported with the studies of Surjit Kaur, 2002 and Beena, 2004 and the financial performances have not been able to create a substantial shareholder wealth to the acquiring company. The main synergies of the acquiring companies have not been fulfilled and the M & A could not add values to the overall system. The overall research has demonstrated that the financial/operational performances and the shareholder wealth of the acquiring company have significantly deteriorated in the post-merger. The strategic opinion leaders have stated that M & A can enhance the operational and the financial performances of both bidder and the target company in long run and it synergies the shareholder wealth of both the companies.

Recommendations

The Merger and Acquisition has been a strategic tool in the global economy to enhance the overall performances and the shareholder wealth of both the acquiring and bidder firm. The M & A needs to decide after an in depth analysis of the financial performances of both the firms. The M & A increase the total asset base in the new entity and the pre-merger studies are a must to identify the significance value additions. The cultural aspects and the organizational values need to concern in order to minize the conflicts of the new entity. The pre-merger studies can convey the positive impact of the M & A on the overall performances and the shareholder wealth in order to avoid the perception dilution of the process.

The synergies of the M & A need to identify and design the specific steps to achieve the synergies in short run. The M & A has defined as a tool to achieve the long run success; the firms need to develop short and long run strategic plan for the new entity. The environmental analysis tools such as PESTEL, Porter's five forces model, 7 C's analysis and Ansoff matrix can provide a strong platform to understand the environmental impact on the M & A entity. The prior discussions on the dividend policies, share price and the organizational structure can minimize the future concerns on the entity.

The application of the M & A concept in Sri Lankan context is a complex process and the specific factors need to identify in order to maintain the process flow and the complexities.

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Design of a Mobile Handset Antenna for Hearing Aid Compatibility – ‘HAC’

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Abstract

With the vertical growth of wireless and mobile communication, the necessity of mobile Handsets compatibility with Hearing aids is well understood and accepted by both service providers and the handset manufacturers. This is to Design an Antenna with a suitable handset chassis so that the Electric and Magnetic field strengths at the earpiece of the headsets are within the limits recommended by Federal Communications omission to avoid the interference between the handset and the Hearing aid used by the people with hearing difficulty. After a study of variable type of hearing aids available in the market, different types of antennas are analyzed for the near-field strengths, with different type of physical phone models. Then an antenna which is similar to the one used by ‘Antenova’ is designed to have required dual band operation(GSM900 and 1800 MHz) and the performances are analyzed using CST Microwave Studio. Then the designed antenna is constructed in the antenna workshop and near field strengths are measured and analyzed which is finally followed by conclusions.

Author Keywords

Hearing Aid, Telecoil, EM Field, Radio Frequency, Electric and Magnetic Field, Interference, Signal to Noise Ratio, Digital Signal Processing, CST Microwave Studio®

Introduction

With the vertical growth of mobile communication technology, the number mobile handsets users those who are using hearing aids also increased drastically. The latest hearing aids are using Tele Coils incorporated with existing microphones. The use of Telecoils T-switch mode with mobile phones leads to an inconvenient annoying noise due to:

- RF interference
- Non-RF interference

Research has shown that some mobile phones cause more interference and that some hearing aids are more susceptible than others to interference. RF interference arises when the T-Coil demodulates the RF Burst transmitted by the Mobile antenna and the second one is due to noises like Backlight, batteries varying current etc.

In general, an antenna is considered to be the RF emitter in mobile terminals, but in practice the whole system including the chassis act as a RF radiator, where the main function of the antenna becomes to couple the mobile terminal (Especially chassis, and worse in GSM900). [3]. Federal Communication Commission (FCC) has recommended some standardization for all mobile manufacturers and Operators so that the RF emission (Both E and H Field) should be less than a given limits.

The Objective here is to design and analyse an antenna with different type chassis models and antenna location within the handset to find out a better model so that the electric (E) and magnetic (H) fields are within the limit.



Fig.1. Wanted and Unwanted EM fields by Tele-coil

Tele-coils (T-Coil) used in Hearing Aid.

T-coils, also called induction coils, are embraced of a metal core, around which ultra-fine lead is coiled. The T-coil detects EM energy and transduces (or converts) it to electrical energy. T-coils can also be used to pick up magnetic signals, just as a microphone picks up an acoustic signal; the T-coil then sends the signal to the hearing aid circuit or processor for amplification. [3].

The conventional category of T-coil can be passive or active. Passive T-coils are principally a rod with an emaciated wire wrapped around it. Active t-coils are effectively passive T-coils with a pre-amplifier, which may be of use to filter the electromagnetic interference generated by digital cell handsets.

T-coils can typically be built into behind-the-ear (BTE) and in-the-ear (ITE) hearing aids, and, can intermittently be built into in-the-canal (ITC) and completely-in-the-canal (CIC) hearing aids, provided there is sufficient span in the hearing aid shell to have room for the telecoil.

Buy and Price of T-Mode

Even though 'T-coils have quite a few advantages they are susceptible to electromagnetic interference. Fluorescent lights, some computer monitors, motors, transformers, alarm systems, and digital cell phones, all radiate magnetic energy, which may cause a humming sound.

This may be reduced or eliminated if the hearing aid wearer moves their head slightly, repositions the neck loop or telephone, or moves away from stationary sources of EM energy, but this is a non-technical measure, but there should be a permanent and standardized way of eliminating this issue.

As the main source of interference to hearing aid while used with a digital mobile phone is the RF interference generated by the handset transmitter (antenna). In real environment the antenna is not only the source of RF signal, but the handset itself is a RF emitter due to the coupling between the antenna and the chassis of the handset'. [1]

The issue of interference and Solutions.

There are several solutions to limit the emission picked up by the T-Coil, such as

- i. Increasing the Strength of radiated Induction, so that SNR increases.
- ii. Increasing the size and effectiveness of the speaker in the mobile.
- iii. Providing an option of HAC selective mode in mobiles
- iv. Reducing the interference by the design and the shape of the phone.
- v. Eliminating the unnecessary interfering by Backlight by having automated control.
- vi. Design of battery component to cancel the inductive EMI.
- vii. Design a Shielding to reduce both RF and Non RF interference at the earpiece.

Recommendation Federal Communications Commission (FCC)

'In July 2003, the Federal Communications Commission (FCC) modified the indemnity under the Hearing Aid Compatibility Act of 1988 to require that wireless phone manufacturers and wireless phone service providers make digital wireless phones accessible to individuals who use hearing aids.

The FCC has taken steps to increase access to wireless telephones by requiring wireless carriers and equipment manufacturers to make more digital wireless phones hearing aid-compatible. FCC modified the preliminary handset deployment benchmarks specific to Tier I wireless carriers.

Specifically, the rules are:

The FCC recommended values of Both Electric (E) and Magnetic (H) field values for low band frequency operation are given in Fig.2:

The ratings indicate the sound quality of the handset when used with a hearing aid and are established by the American National Standards Institute

Category		Telephone RF Parameters			
Near Field	AWF	E-Field Emissions (Peak)		H-Field Emissions (Peak)	
Category M1	0	46 – 51	dB (V/m)	-4.4 – 0.6	dB (A/m)
	-5	43.5 – 48.5	dB (V/m)	-6.9 – -1.9	dB (A/m)
Category M2	0	41 – 46	dB (V/m)	-9.4 – -4.4	dB (A/m)
	-5	38.5 – 43.5	dB (V/m)	-11.9 – -6.9	dB (A/m)
Category M3	0	36 – 41	dB (V/m)	-14.4 – -9.4	dB (A/m)
	-5	33.5 – 38.5	dB (V/m)	-16.9 – -11.9	dB (A/m)
Category M4	0	<36	dB (V/m)	<-14.4	dB (A/m)
	-5	<33.5	dB (V/m)	<-16.9	dB (A/m)

Fig.2 Recommended Near field Values (Reproduced - [1])

Recommended Solution

Currently Clamshell phones are found to be a solution this issue. But in clamshell phones it is possible to have the earpiece and the HAC coil in the Flip component (top) of the phone and the antenna in the lower component, so that there is a considerable isolation between the antenna and the T-Coil.

In Clamshell phones, the antenna may be at the one of the end of chassis or in the lower component closed to the hinge.

But the past analysis and studies shows that there will be current maximums, one at the antenna point and the other at the hinge of the chassis of the clamshell phone.

So, having the antenna closed to the hinge is in risk of feeding the system from it's Current maximum point. [3]

The shape and the design of two components of the clamshell decide the current distribution and its maximum, where the hinge can be represented with a parallel Inductance and Capacitance.

Approach to Solution

Design and analyses a model to find the

- Optimum Antenna Location,
- Shape and the size of the chassis,
- The equivalent inductor & capacitor,

So that there will be enough signal separation at the earpiece recommended by the FCC.

Near field Measurement requirements

In the current draft of ANSI 263.19 an area 5 cm square is controlled for use by a hearing aid. This area is defined as being 1 cm from the surface of the phone, over the area of the receiver. Specifically it begins at the top edge of the body of the phone and comes down over the receiver area of the phone. It is centered, left to right, about the centerline of the phone. The field strength in this area is to be scanned using near-field probes for both the E and H field. Because the area is deep within the near field of the antenna sharp field gradients are common. Field variations of over 100 V/m can be found within this 5 cm square area. Hence, it is vital that careful scans of the entire area be made to accurately assess the peak field potential. Readings should be taken at increments of 2.5 cm and closer Spacing is preferable.

The concern in assessing these fields is the interference potential of the emissions. Therefore, it is the peak field value, which is of interest. Probes and their supporting instrumentation system must be capable of fast response. It is common for the transmitter to function only one eighth of the time.

This 5x5 square grid is then divided into 9 sub grids, which are individually scanned. The highest value from each sub grid is then noted. The 3 highest contiguous elements of

the sub-grid, not including the centre square are removed from the results. Up to a total of 5 grids (3 for E and 3 for H having at least one on each) may be removed prior to the final calculation. Using the remaining elements in the grid the highest E and h field are calculated. This calculated value is then compared with the recommended value.

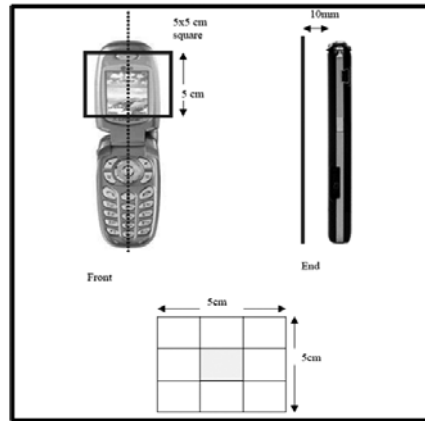


Fig.3 Measurement Method for Near Field.

Clamshell with PEC Hinge

In order to analyse the performances of mobile terminal's compatibility with the Hearing aids, it is necessary to study the active near field region for both E and H fields.

Here an antenna, similar to the one used by Antenova is designed (Thanks to Antenova and Prof. B. Colin.) with different types of chassis in order to find a point where E and H fields are within the limit of FCC recommendation.

To find the best position for the earpiece where the near field strengths are within the limit I have analysed three different types of Clamshell chassis with the same antenna.

1. Antenna at the centre and fixed to the lower part of the Clamshell.
2. Antenna at the centre and fixed to the flip part(top) of the Clamshell.
3. Antenna at the bottom of the lower part of the Clamshell

As the field at any point 10 mm away from the model is very high in the first two models the third one is analysed for further improved results.

A Clamshell having 80mm lower part and 65mm flip part width 30mm width is modeled with a patch antenna (almost same as the one used by Antenova). 16 E-Probes and 16 H-probes are placed at 10 mm distance from the model.

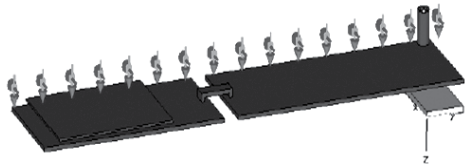


Fig.4 Clamshell chassis with probes

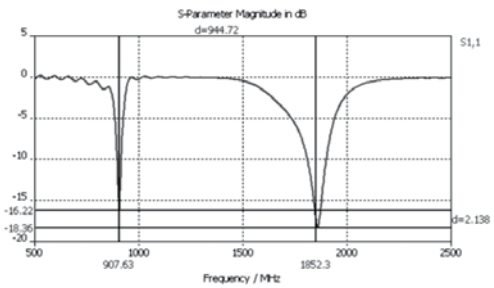


Fig.5 Forward Reflection Coefficient, S11.

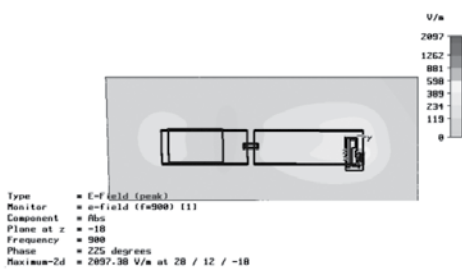


Fig.6 E-Field pattern at a distance of 10mm.

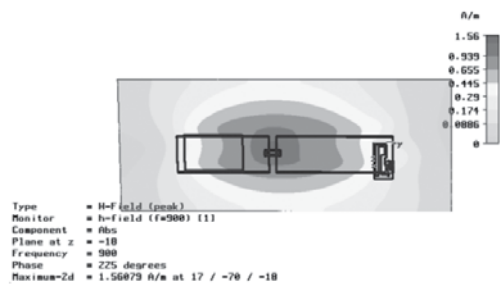


Fig.7 H-Field pattern at a distance of 10mm.

It is obviously seen that the H-field is high where the E-Field is low and vice versa.

When analyzing all 32 probes at resonant frequencies, it is seen that Probe number 16 is the only one having the Field strength within the limit recommended for Category M1.

In this design the feeder is fed with 1W (default) power. In reality if the phone is fed with 2W power, then the probe readings will be 3dB more than these values. Given below are the readings of Probe No.16.

Freq.(MHz)	900	1800
E (dBV/m)	47.54	44.4
H (dBA/m)	-17.03	-14.07

In order to comply with Category M1, further improvement is needed.

Clamshell with a plastic hinge

In order to minimise the coupling from the antenna to the flip part of the Clamshell model, a non-PEC hinge is introduced replacing the PEC hinge.

As the Permittivity varies between 4 and 10 for plastic depending on the frequency, a material with 5 is used in this analysis.

The length of the lower part of the mobile chassis is 80mm and that of the flip part is 65mm, where the width of the designed chassis is 30mm(random).

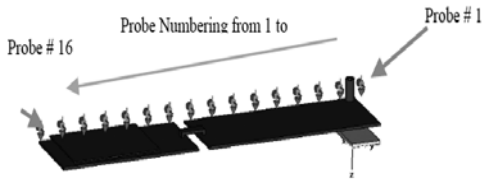


Fig.8 Clamshell with PEC / Non-PEC hinge

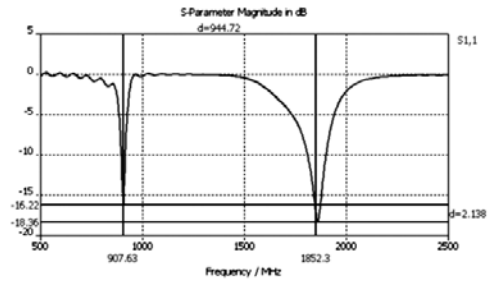


Fig.9 S11 of Clamshell with PEC hinge

The reason for the difference between the above two S11 plots is that, in the PEC hinged one, both the lower part and the flip part of the ground plates act as a single ground so the size of the effective ground is larger than the other one.

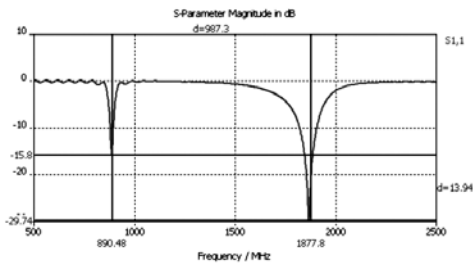


Fig.10 S11 of Clamshell with non-PEC hinge

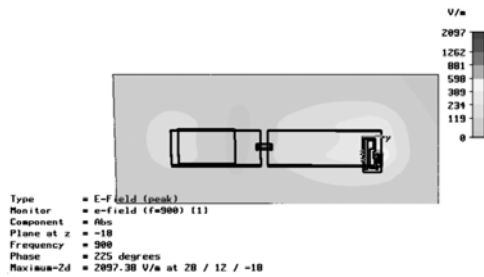


Fig.11 E-Field strength at 10mm from the chassis of Clamshell with PEC hinge.

As the two parts of the chassis act as a single ground plane, the electric field high at the ends of the Clamshell model, so that it may not possible to have a suitable location for earpiece at the ends having the restriction from FCC.

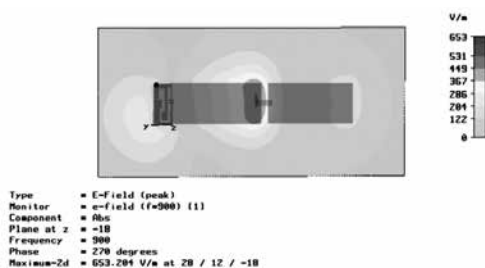


Fig.12 H-Field strength at 10mm from the chassis of Clamshell with PEC hinge

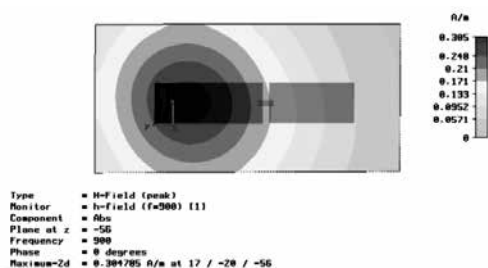


Fig.13 H-Field strength at 10mm from the chassis of Clamshell with non-PEC hinge.

As mentioned above, the H-field in the non-PEC hinged model is also less at the earpiece compare to the one with PEC hinged. This is due to minimised coupling.

As it is difficult to analyse having all the probes readings in a single graph, it is easy to analyse the selected probes, which have readings less than the recommended values.

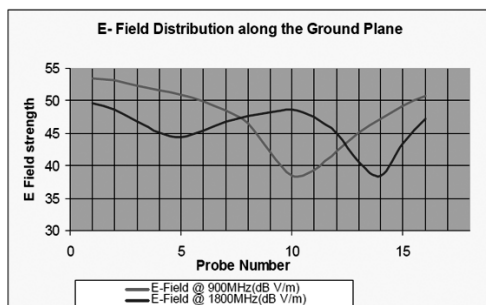


Figure 39. E- Probe readings of Clamshell with PEC hinge

Fig.14 E- Probe readings of Clamshell with PEC hinge

As it is difficult to analyse having all the probes readings in a single graph, it is easy to analyse the selected probes, which have readings less than the recommended values.

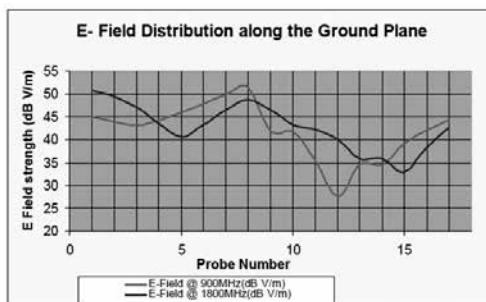


Fig.15 E- Probe readings of Clamshell with non-PEC hinge

It is seen that in the non-PEC hinged one, it is possible to have spots with even less than -40dBV/m of E-field, where the recommendation by FCC for category M3 is -39dBV/m .

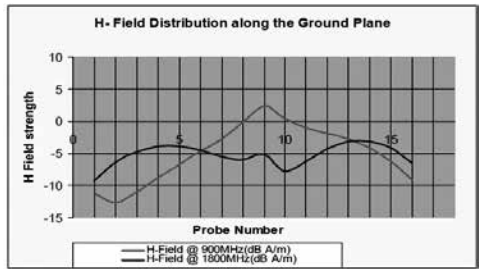


Fig.16 H- Probe readings of Clamshell with PEC hinge

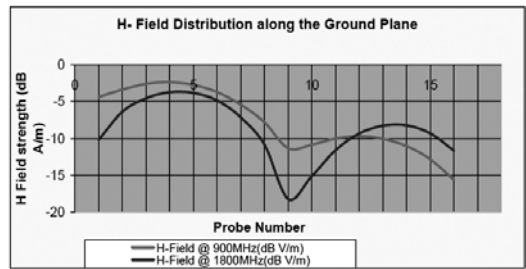


Fig.17 H- Probe readings of Clamshell, with non-PEC hinge

It is observed that the H field is less than -10dB A/m at the earpiece. According to the probe readings along the axis of the ground plane, here we can see that the H field is less than -10dB A/m at the earpiece.

Laboratory Measurement (E)

With a Connecting Cable: two parts of the ground planes were connected with a cable and measurements were taken. As the coupling is high at low band frequencies (900MHz) the measurement analysis should be done in 900 than in 1800 to test against the worst case scenario.

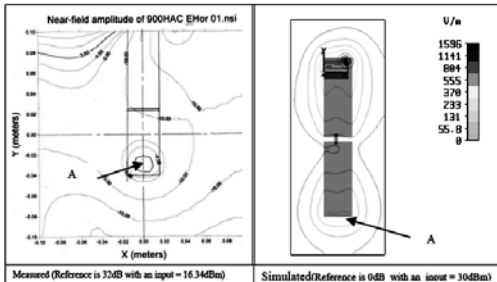


Fig.18 Near field measurements – E-900MHz. (with a connecting Cable)

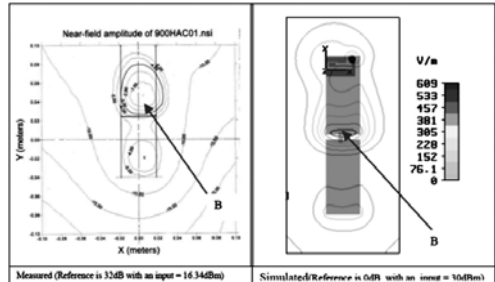


Fig.19 Near field measurements – E-900MHz. (without a connecting Cable)

Conclusions

Though we have the measurement results for E and H near field strengths at an input power of 16.34dBm and 15.46dBm respectively for 900 and 1800 MHz, it is not an advisable method to predict the near field at an input of 30dBm very accurately (1W) using the above results.

To have the accurate analysis of near field, we have to have the measurement setup for feeding with 33dBm (2W) or 30dBm (1W). But these results are good enough to justify the principle and the outcome of the simulation results.

The following are found to be conclusions for the complicated issue of HAC compatibility.

- Clamshell Handsets can provide a better solution than Bar Phone models.
- Antennas to be designed to reduce the Coupling with Chassis.
- Location Of the antenna is the main factor.
- Coupling between the Lower part and the Flip part will play the critical role.
- HAC Phones must be larger in Size compare to normal phones.
- To limit the near field it is necessary to play with return loss at resonance.
- Limitation of near field may affect the Fairfield pattern, compare to normal Handsets

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Structural Health Monitoring using GPR Technique

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Author Keywords

GPR, di-electric constant, velocity analysis

Introduction

Ground penetrating radar (GPR) is widely adopted for sub-surface imaging to assess structural condition and also to locate buried objects. The system is backed by powerful software to obtain an insight into the sub- surface layers. A GPR system comprises of an antenna emitting electromagnetic energy, and receiving the reflected energy from the surfaces as well as that from the inner layers besides a processor. The energy reflected is transformed into visual images, which provide extensive data on the subsurface (inner) materials, when interpreted correctly.

Literature review

How does GPR work?

A GPR system contains data collection unit, the cable, and the antenna. Wide range of frequency antennas are used for different objectives, higher frequency signals penetrate shallower whereas lower frequency signals penetrate deeper. But, there will be loss in resolution when the low frequency antennas used. Therefore, higher frequency antennas are used to get the shallower penetration scan and identify smaller targets.

GPR is electromagnetic technique. It works by emitting energy into a material and recording the signal strength and the time required for the return of any reflected signal. Whenever the energy pulse enters into a material which has different electric conduction property (dielectric content). The strength or amplitude of the reflection is determined by the difference in dielectric content of two materials. The dielectric constant is an evocative number that indicates how fast radar energy travels through materials, it range from 1 (air) to 81 (water), with higher dielectric numbers corresponding to more conductive materials.

When the antenna crosses over a target (such as a pipe, stand, or rebar), the resulting image is a hyperbolic shape as shown as Figure 1. This image is generated because the radiated antenna beam has the shape of a wide cone, and the radar can see the target when on top of the target as well as in several scans before and after that position. The hyperbola shape reveals the antenna approaching the target and then retreating from it. Its peak is represented exact the location of the target.

The strength, or brightness, of a reflection are dependent on the difference between the dielectric content of materials being scanned. Therefore, its greater the contrast between materials, will provide brighter resulting reflection. For example, the reinforcing

steel bars in Figure 1 appear brighter than the non-metallic conduit due to the greater dielectric contrast between the steel bars and the concrete than that between the conduit and the concrete.

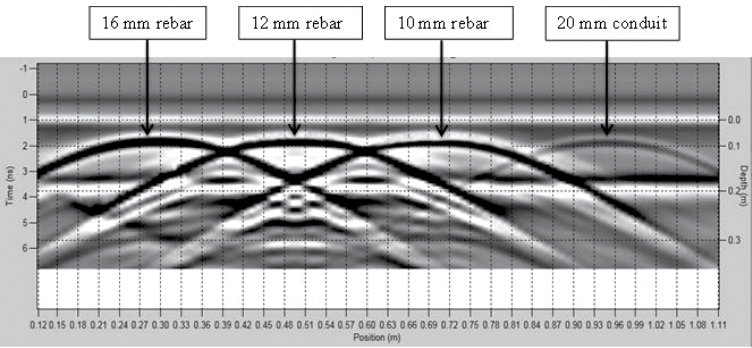


Figure 1: The location of rebars and non- metallic conduit

Methodology

The model was prepared as shown as Figure 2, readings were collected along each and every grids by scanning it with 1000 MHz antenna (Figure 2). Using the reading the 2D & 3D images were developed in EKKO-Mapper software which are is illustrated Figures 3, 4.

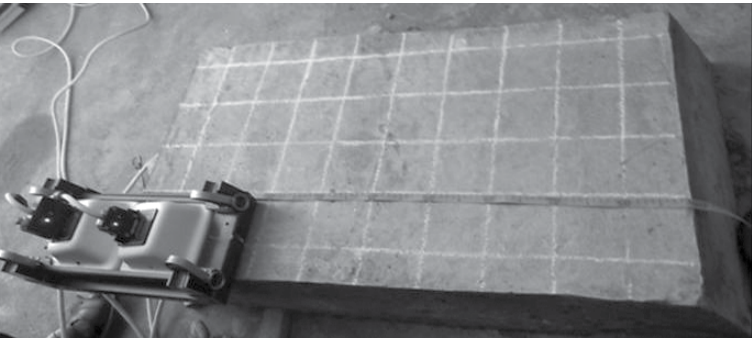


Figure 2: Test slab with the 80 cm ×40 cm grids

All embedded details including the #3 rebar, a non-metallic conduit and voids were obtained in both models and the final measured value were compared with real value. In order to compare the accuracy of GPR the same model were tested by using traditional cover meter method (non-destructive), finally the both non-destructive test results were compared with real value.

Results & Discussions

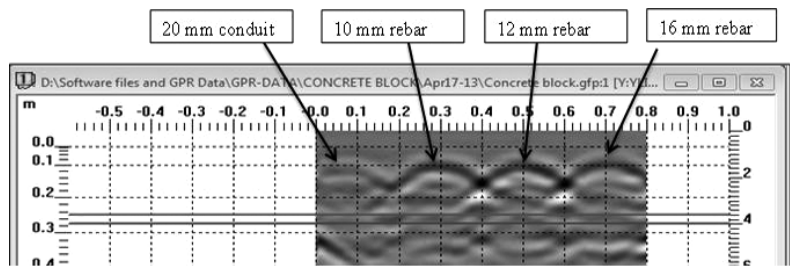


Figure 3: Analyzed image of sectional view of the model 1.

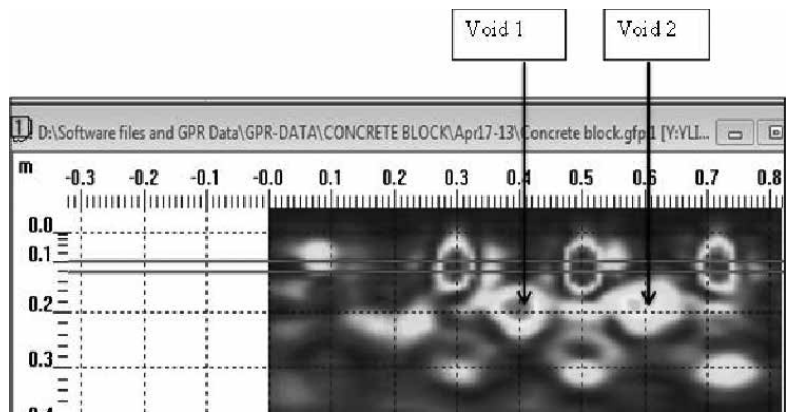


Figure 4: The locations of voids of the model 1.

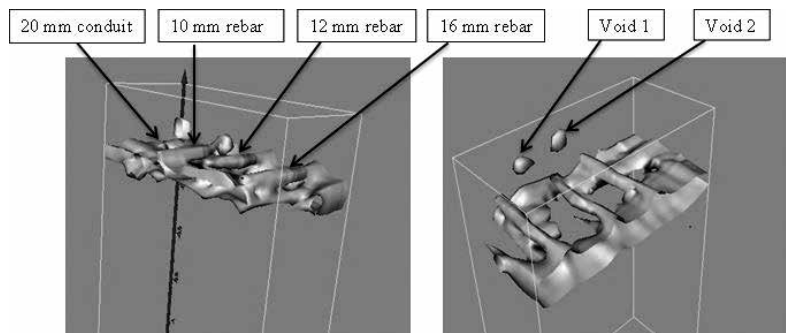


Figure 5: Analyzed 3D image of model 2

Table 1: Depth of the rebar and non-metallic conduit of model 1.

Sizes of rebar (mm)	Actual cover (mm)	Cover meter results (mm)	Results from GPR (mm)
16	24	23	24.4
12	28	31	28
10	30	32	30.6
20 (Conduit)	15	—	22

Table 2: Depth of the rebar and non-metallic conduit of model 2.

Sizes of rebar (mm)	Actual depth (mm)	Results from GPR (mm)
16	150	153
12	150	152
10	150	153.5
20 (Conduit)	150	157.6

Conclusions

Ground penetrating radar (GPR) is mostly accepted to collect the details such as sub-surface imaging locating buried objects. The system is improved by the powerful software to get very accurate details of object insight into the sub-surface layers. A GPR system contains transmitter which is emitting electromagnetic energy and receiver will capture the reflected energy from the surfaces as well as objects which have different deflective content. The final data which have been collected in inspection, then that will transfer to computer to develop detail visual images, which accurately provide extensive data on the subsurface (inner) materials.

The embedded rebar could be located clearly and non-metallic conduit could also be detected in this technique. To get most reliable/accurate results there are two different model were prepared and tested separately, while those models were also tested using the cover meter. At the end of the things all the non-destructive testing results were compared with actual value as shown as Table 1 & 2. There were 1 mm tolerance between

the real value and mean experimental value for smaller depth inspection. Whereas there were 2 mm tolerance between the real value and mean experimental value for higher depth inspection when the GPR were used. On the other hand when the cover meter were used, it worked only at smaller depth inspection, the tolerance was also 2 mm. Therefore GPR is very accurate during both smaller & higher depth inspections.

Furthermore, GPR were useful to detect the non-metallic conduit, however the cover meter doesn't have that facility. Cover meter only detected cover size up to 80 mm, but it could be possible in GPR up to 150 mm. Apart from that, the voids which had been made inside the concrete, also could be detected by GPR. In GPR we obtained not only the located depth but also we measured the distance from the edges (location in 2D) of the model. There were tolerance between real value and mean measured value is 3 mm for inspection of depth of voids and is 9 mm for inspection of location. This will be much enough accuracy for non-metallic inspection. Therefore GPR is one of the accurate method of non-destructive inspection.

There are some darker side in this technique. Experience judgment should be required when it applies in the real scenario, because it is very important when the required drawings and other details of the structures are absence. Relevant numerical program such as EKKO mapper, EKKO Viewer etc. are required to develop final accurate results. Technical persons are required to conduct the inspection from initial stage to final completion.

All in all, GPR is yet another valuable tool in the repertoire of civil engineers for non-destructive testing and quality control.

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Towards Progressive Realization of Human Rights

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Abstract

This brief paper deals with the development of human rights in our time and significance of understanding new developments in the context of human right law application especially in Sri Lanka context. For this purpose, deductive method was adopted though it contains some inductive characters. Further, this paper contains the references from certain decided cases and some other case/academic references.

Introduction

Human Rights are regarded as inherent and inalienable rights as every human being is born with his/her rights and he/she is entitled to universally recognized rights while he/she equally respects others' rights. The human rights are neither originated nor expounded by the states. The states have duties to secure and protect human rights of their people and ensure that they are not violated. In our time, many states have undertaken as part of their international obligations (especially under International Covenant on Civil and Political Rights-ICCPR) to implement and enforce the rights enshrined in International Conventions in their respective states

Domestic Obligations as the Part of the Social Contract

Many believe that the states' duties to implement and protect human rights originate only from their international obligations but states have fundamental domestic obligations to protect human rights of their respective people. These obligations are derived from the social contract which states normally enter into with their people, under which they have primary obligations to secure and protect human rights of every citizen of their respective states.

No modern state could exist or function without the social contract and it is people who give authority to the state or to its agent (government) to manage their affairs. Under the social contract people surrender or delegate certain rights to the state and retained or reserved their fundamental rights to themselves.

Further under the social contract, rights that are not delegated or retained by people, the state undertakes to protect them (both individual and collective rights). In modern times people do not give authority to states to establish absolute or totalitarian regimes but they wanted states to protect their basic rights as the primary duty of the state. The terms of social contract of a state (rights/duties of the state and rights/duties of the people) are normally enshrined and reflected in its constitution and other respective laws.

For instances, the tenth amendment of the US Constitution expressly reserves the powers not delegated to the United States under the constitution or nor prohibited by it to the States, to the States or to the people. The US courts have affirmed this position in several leading cases. For instance, in **Butchers' Union case** (1883) 111 U.S. 746.) Field J observed, "...all men are endowed, not by the edicts of Emperors or decrees of Parliament or Acts of Congress but by their Creator, with certain **inalienable rights' that is, rights which cannot be bartered away** or give away except punishment of crime, and among these are life, liberty and pursuit of happiness, and to secure these, not grant them but secure them, governments are instituted among men, deriving their just powers from the consent of the governed". (Bolded- Emphasis Added)

Although under the Indian Constitution there is no provision similar to one mentioned above, in Gopalan case Sastri J. stated, "It is true to say that, in a sense, the people delegated to the legislative, executive and the judicial organs of the State their respective powers while reserving to themselves the fundamental rights which they made paramount by providing that the State shall not make any law which takes away or abridges the rights conferred by that Part (of the Constitution) ..."(1950-SCR 88).

Hence it is a duty of any state to secure these rights since protecting and advancing them should be the core values of the constitution. As the part of its primary duty, a state should protect its people' rights and ensure justice to everyone by applying equality and equity in addressing or resolving any problems of its people.

Justice, Equality and Equity are the cardinal principles and fundamental requirements, not only for successful resolutions of any dispute among the people but also to unite diverse people under one National banner. These cardinal principles are the fundamental values which cannot be subordinated to other claimed values.

From Negative to Positive Obligations

Traditionally, the states undertake negative obligations to protect human rights. The negative obligation implies as an act of abstaining from human rights violations and thus the states play only a passive role. The modern development proves that several states apart from classical negative obligations also undertake positive obligations whereby they seriously engage formally and officially to secure effective enjoyment of human rights of their people. It means a state not only has obligation to refrain from human rights violation, it is also has obligation to undertake necessary action to ensure that the people enjoy their rights without any obstruction (Progressive Realization of Human Rights).

If we merge both negative and positive obligations together, a state has the following obligations which are known as the Generic Obligations:

- (1) Respect-bound obligation
- (2) Protection - bound obligations and
- (3) Fulfilment - bound obligations.

Respect Bound Obligation

Under the respect bound obligation, a state has the duty to ensure that the human

rights standards are respected and it (state) should not make any attempt to destroy or diminish these standards. These standards should be enshrined in the constitution and other relevant laws.

Protection Bound Obligation

Protection bound obligation demands a state to take positive actions by creating necessary mechanism to prevent infringement or violation of people's rights. In **Bandhua Mukti Morcha v. Union of India and Others (1986)**, an Indian non-governmental organization by way of a letter sought the intervention of the Supreme Court regarding the inhuman and intolerable conditions of workers employed in stone quarries near the city of Delhi. The court considered the letter as a writ application. The court held that article 21 of the Indian Constitution guarantees the 'right to life' and it includes the right to live with 'human dignity' and free from exploitation and further held that state government has the constitutional obligation to ensure that the mine lessees or contractors were observing social welfare and labour laws enacted for the benefit of the labourers (ICJ Review 36, 1986). The Indian Supreme Court by this ruling laid emphasis on the state that it has positive duty to realize the people's rights.

The state stands by the Victims

The state intervention is the main aspect of the positive obligation of a state to protect human rights. The state intervention means the state plays more active and dynamic role to protect human rights of its people. The state intervention should take place at two levels: (1) intervenes to take necessary steps to prevent human rights violation and (2) intervenes when the individual rights are violated, to assist him/her to seek justice and obtain remedy.

In the US, the Justice Department has intervened in several cases where the people rights were violated. For instance, in *Nishala Hearn v. Muskogee Public School District* case (2004), the United States Justice Department intervened as a plaintiff intervenor to assist a sixth grade student who was unfairly victimized and singled out based on her religious faith. (www.justice.gov/.../hearnokbrief.pdf).

The purpose of these interventions is to ensure that no state laws or even federal laws could override the constitutional guarantees given to the people. Since the constitutional guarantees of rights are very important terms of the social contract, a state cannot and should not permit any authority to violate or infringe them under any context or guise. When such guarantees are practically ignored, overlooked and infringed, the people will lose confidence and trust in functional democracy and justice system of that state. This will also amount to deprivation of the people's rights which they did not surrender or delegate to the state under the social contract.

Many states including Sri Lanka have guaranteed human rights through their respective constitutional provisions which provide remedial measures in event of infringements by referring them to the court/s (fundamental right action). The filing of fundamental right action in the case of infringement of one's right squarely depends on the decision of the victim. The victim has the option either to refer the infringement to the Supreme Court to seek redress or ignore the infringement without seeking any redress. Naturally, every victim tends to seek justice and remedies but the victims also involuntarily relinquish the

constitutional rights to seek redress due to several reasons. These reasons could be identified as:

1. unaware that such rights exist
2. unbearable cost involved
3. doubtfulness of the outcome (success/failure)
4. Threats-whether they are perceived or real
5. When the opportunity cost of such decision is very high (taking all obstacles into account)
6. Fear that they are falling into problems or inviting risks and
7. The elements of uncertainty surrounded in the whole process.

When the victims elect not to pursue their cases due to one or more of above mentioned reasons, not only violators of people's rights are not punished but alarmingly and disturbingly people's rights are not protected as they do not have necessary support from the state to get justice or relief.

Human rights protection also needs a special treatment from the state as it expressively, sensitively and emotionally deals with the people's lives. A state by playing a positive role makes those who overlook or violate people's rights to realize that the violations of rights are intolerable and they could not escape such violations without punishment as the state stands by the victims. The positive role by the state in this context, will directly contribute for political stability and unity among the people especially in a pluralistic society as the people will have faith in the human rights regime.

Fulfillment-Bound Obligation

Only through establishing necessary mechanisms / infra structures, a state could discharge its duties to protect people's rights. In order to ensure effective and meaningful operation of Human Rights Regime, a state has the following duties to discharge:

1. Making necessary laws particularly under the Constitution to protect the rights of the people
2. Promoting Human Rights (Human Rights Education and Campaigns)
3. Creating Enforcement Mechanisms Through the Court/s and other Bodies;
4. Monitoring
5. Intervention
6. Rewards/Punishment
7. Reconciliation among the diverse groups.

When a state does not perform one of these duties especially the duty of intervening in the case of violation (assisting the victim) it will play only a passive role without performing its assertive or dynamic role as the human rights protector of its people and this will seriously threaten the freedom, liberty of the people and political stability of that state.

Under the Sri Lankan Constitution, the state has undertaken respect-bound duty by enacting the Fundamental Rights Chapter in the constitution (though not exhaustive) and as far as the protection bound duty is concerned the constitution has provided the right to victims of the fundamental rights violations to seek justice and redress in the highest court of the Country-The Supreme Court.

However, the state does not play a crucial role as the initiator or intervenor of the action on behalf of the victims or at least as the petitioner's intervenor to assist the victims (as in the US case of Nishala Hearn). This situation normally leaves the victims in a helpless state as they have to fight their own cases against the powerful state or administrative authorities.

Conclusion

As noted above, to discharge fulfilment bound duties Sri Lanka needs necessary laws, infra structures and independently functioning authorities. More importantly, the will of the people's representatives is indispensably necessary for progressive protection of human rights of everyone. If we can protect the rights of our people in a positive, affirmative and assenting manner we could be an exemplary state in the human rights setting and further it will be the best weapon to prevent external intervention in our affairs through human right issues.

ICT Performance - Shaping the Internet Use

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Abstract

Continuous integration of the physical and virtual worlds opens up distinctive strategic, operational and competitive advantages for individuals and businesses. The technological developments generated through the Internet revolution are paving the way for the modern devices - extending the reach of the internet to directly control the physical world, including system and technologies.

Alike businesses, individuals today need self-adaptive, robust, safe, affordable and interconnected solutions to maximize this opportunity. The processors are at the forefront of mounting assimilated Information and Communications Technologies (ICT) solutions to meet these challenges. Since then the processor has grown the business and individuals need for speed. While this also helps increase economic activity & enhance quality of life. While several routine situations, speed is at the core however this means fast decisions and typically mean more errors. To this day, it remains unknown whether response times can be reduced with appropriate training, within one individual, across a range of tasks, and without compromising accuracy. Here we review evidence that the very act of browsing internet or playing action video games significantly reduces response times without sacrificing accuracy. Critically, this increase in speed is observed across various tasks beyond one situations. Understanding the usage of internet may therefore provide an efficient training regimen to induce a general speeding of perceptual response times without decreases in accuracy of performance.

Author Keywords

Processor, Processing Speed, Performance

Introduction

The main argument many times where people assume they don't need many apps or they are not internet savvy. Average users have not realized how accustomed they've become to all of the useful apps that are available on none other but internet platforms. Internet radio, banking, weather, news, sports, games, cloud storage, photos, sharing, commerce, shopping, Lotto and automation, etc. Today's Users just don't realize how many times they interact, if even briefly, with some kind of mobile, internet app in action. So what if the OS is not so stable. That's a big thing for today's user experience on the internet. The validity of performance is in its smooth operation, crash proof, offer solid multitasking e.g., surfing the web as well listening to a podcast or music, and require all their respective sounds play at the same time, etc. One need to be able to flip in and out and over to different apps quickly. Features, yes a good point but aren't we looking for performance first as all the current features or host of features which are bundled or rather forced on the users may not all be in "nice to have" list. Rather most of such features are added to the device / platform for its marketability and attractiveness but it's less likely to be of desired or must have for enhancing the user's integrated internet performance.

Experimental

The origin of the Internet's performance problems lies in our inability to take a system-level, end-to-end view of this setup. While there are tools that can provide information on performance parameters, resolving the Internet's end-to-end performance (including devices) problem requires a more sophisticated solution. A system-level view of the Internet encompasses host platforms, which include their device hardware, operating system (OS), and application software. So if device hardware and the OS aren't limiting end-to-end Internet performance, then what is? Internet reports leverage lots of data to share an informed view into online connectivity, cyber-attacks, virtual security developments and metrics, including connection speeds, outages, broadband adoption, mobile usage and web security threats.

As each new generation of computer processors arrives with a larger number of computing cores, computer scientist's grapple with how best to make use of this proliferation of parallel power. The current research have a data structure that claim to help large multicore processors churn through their workloads more effectively. This can do away with the traditional first-come, first-served work queue and assign tasks more randomly. While at the other end the retailers only target fast approaching holiday season to ensure that they can deliver a great customer experience on any device, anywhere while managing sales that can be 3x or 4x higher than average. Another big challenge today is the fact that device sales mostly influenced by web and mobile channels. Retailers need to get the internet experience right or risk losing customers.

Operating System	3Q15 Units	3Q15 Market Share (%)	3Q14 Units	3Q14 Market Share (%)
Android	298,797	84.7	254,354	83.3
iOS	46,062	13.1	38,187	12.5
Windows	5,874	1.7	9,033	3.0
BlackBerry	977	0.3	2,420	0.8
Others	1133.6	0.3	1,310.2	0.4
Total	352,844.0	100.0	305,384.0	100.0

Table 1: Worldwide Smartphone Sales to End Users by Vendor in 3Q15 (Thousands of Units)
Source: Gartner (November 2015).

While the raging war on the Mobile as an extremely user friendly and attractive platform the above figures shows that worldwide the OS market is led by Android followed by iOS, third being the Microsoft and the fourth is BlackBerry. Brad Linder comments that this would less likely to change as the users who switch each year from their existing platform is moving towards Android and iOS. The data shows that every year 60% users switch to Android while 15% switch to iOS.

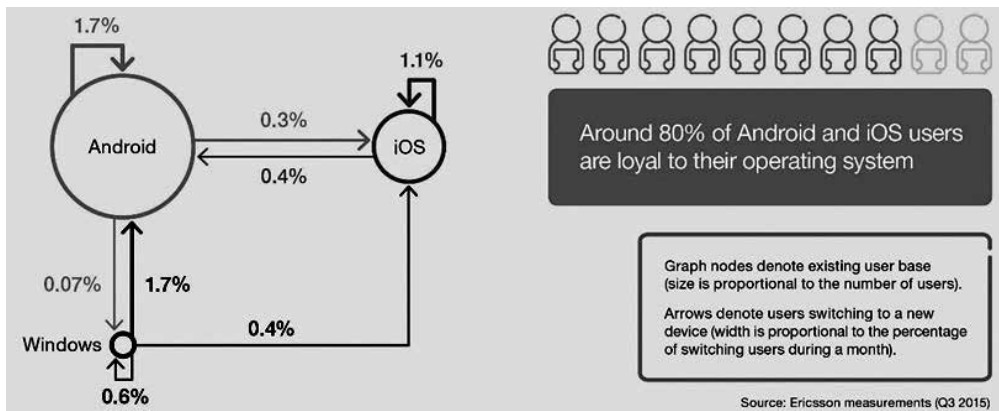


Figure 1: Monthly switching rates for different smartphone operating systems

Pleasingly there are many players in the industry putting this platform on variety of devices, yet none of them has prime concern that the user could get desired performance with the increasing technology adaption where internet speed is just getting multiplied every year. The users who switch aren't bogged down with the devices or platform but the most frustrating elements of the OS which is the main barrier in giving the incredible experience of the internet along with desired speed.

Period	Android	iOS	Windows Phone	BlackBerry OS	Others
2015Q2	82.8%	13.9%	2.6%	0.3%	0.4%
2014Q2	84.8%	11.6%	2.5%	0.5%	0.7%
2013Q2	79.8%	12.9%	3.4%	2.8%	1.2%
2012Q2	69.3%	16.6%	3.1%	4.9%	6.1%

Source: IDC, Aug 2015

Table 2: Smartphone OS Market Share, 2015 Q2 Source: IDC, August 2015

The companies which didn't fix the frustrating element of OS are losing market share and in desperation mode as they can't afford to hang their user out to dry. Further there is compatibility which bites hard and Microsoft has frantically been trying to get its ducks in a row, first with Windows 8 (not to forget Windows XP death row) and also with the Microsoft CE which failed to update and uphold the users loyalty and this may be only reason users haven't recommended it to their family and friends. Google on the other hand had tough claims on the Glass and also had to put back or rather give up on Tabs. While all this wasn't a tech issue, it was a perception issue but finally the users performance count.

Stability is not be taken lightly as though even that will differ slightly but are users ready to allow updates in the times where privacy, personal and security is of so much concern. Recently a couple has won a lawsuit against Apple after having his precious photos accidentally deleted during a repair visit to Apple Store and this results in claiming that Apple employees were “negligent” with users photos and data.

Given the heterogeneity of the stakeholders in an Internet value chain, the roles that internet can play in each of the levels of the chain may be influenced by many factors such as infrastructure for access, internet affordability, internet connectivity, access to internet; usage of ICTs, up to date and innovative technologies, quality and availability of information content, limitation of the media, support services and training, “culture of use” of ICT, “information literacy” and also the individuals’ choices and their appropriation of ICTs.

The potential “virtual” relationship between stakeholders in the internet performance value chain may have a counterproductive effect with the consultations and connections that have been based on device and end to end performance / interaction (integrated performance factors).

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Potential impacts of Building Information Modeling (Bim) on Estimating Practices in Sri Lankan Context

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Abstract

Based on Computer-Aided Design (CAD) drawings Building Information Modelling (BIM) is a thriving technology which laid potential to address problems in conventional practices. Cost Estimation is extremely significant task in any building project since it's functional to buildings. Less implementation amongst quantity surveyors is due to lack of consciousness of the probable of BIM application toward their profession. Quantity surveyors are still hesitant of the potential of BIM in their practice. It is still usually under explored how BIM application gives to quantity surveyors performance development. This research endeavor to recognize the capabilities of BIM application in quantity surveying practice to increase awareness. BIM can provide accurate and automated quantification, and assist in considerably minimizing unpredictability in cost estimates as a visual database of building components. The intention of this research report is to examine the qualities of BIM and the influence it will have on the cost estimation practices in quantity surveying profession in Sri Lanka, all the way through research of the pros and cons and challenges that it brings forth.

Author Keywords

Building Information Modelling (BIM), Cost Estimating, Quantity surveying.

Introduction

BIM is defined by the National BIM Standard (NBIMS) as “a digital representation of physical and functional characteristics of a facility” (National Institute of Building Sciences, 2007, p. 21). The concept of BIM is to build a building virtually, prior to building it physically, in order to work out problems, and simulate and analyse potential impacts. The heart of BIM is an authoritative BIM model (Smith, 2007, cited in Wijayakumar and Suranga, 2013).

BIM and sustainable design construction are two important primary trends that are driving these changes in the industry (Johnson and Gunderson, 2009, Cited in Building Information Modelling (BIM); How it Improves Building Performance, the designer's spectrum has changed from merely designing the building to the management of the building throughout its life cycle. Today's building designers need to satisfy many different criteria to provide high quality, comfortable buildings that also comply with building regulations, minimize life cycle costs to the clients, optimize energy costs, reduce environmental impacts and confirm with internationally accepted energy performance levels.

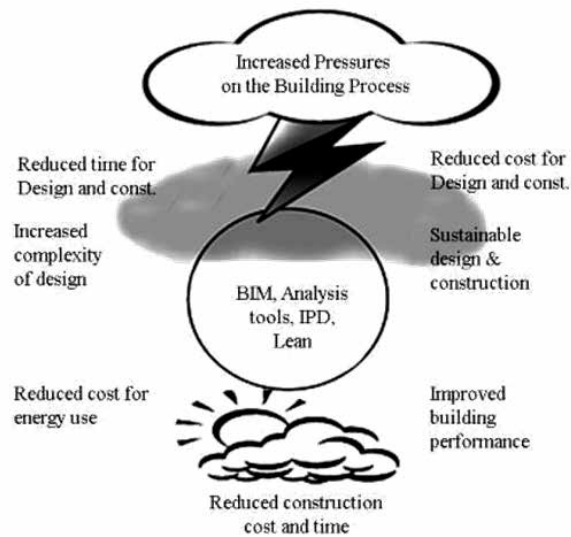


Figure 01: BIM Process over a building life cycle Source: (Estman, 2011)

On the other hand BIM also accommodates many of the functions needed to model the lifecycle of a building, providing the basis for new design and construction capabilities and changes in the roles and relationships among a project team. When adopted well, BIM facilitates a more integrated design and construction process that results in better quality buildings at lower cost and reduced project duration.

Although BIM has existed for over 20 years, it is only over the last few years that building owners are becoming aware that BIM promises to make the design, construction and operation of buildings much more streamlined and efficient (Coates *et al.* 2010). This literature review is aimed to build a clear and systemic understanding about the potential impacts of BIM in Sri Lanka.

Further, it is mentioned by Wijayakumar and Jayasena (2013) BIM is still not implemented in Sri Lanka. Hence it's the big challenge to use BIM based QTO. There are several challenges for implementing BIM as well as using BIM based QTO. It is need to lot of requirements like hardware, software and liveware modifications shifting from CAD based current Sri Lankan construction industry to BIM based system. This will cover the way towards the current Quantity Surveyors to become fortified with the essential skills and competencies to drive the next global wave of BIM in order to continue in the pole position of the industry. The review monitors first recognizes the significant features of BIM and identifies its new trend for QS practice.

The brief of the widely used processes and tools within the construction industry for the delivery and transfer of building information are shown in Figure 02 below.

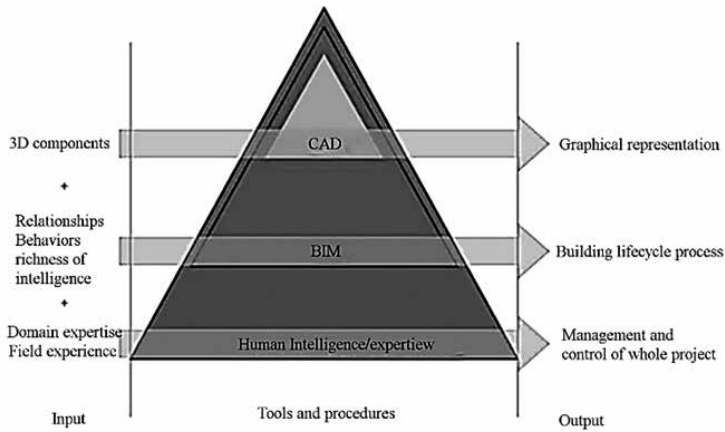


Figure 02: Building Information Applications, Processes and Tools
Source: (Wong and Yang, 2010)

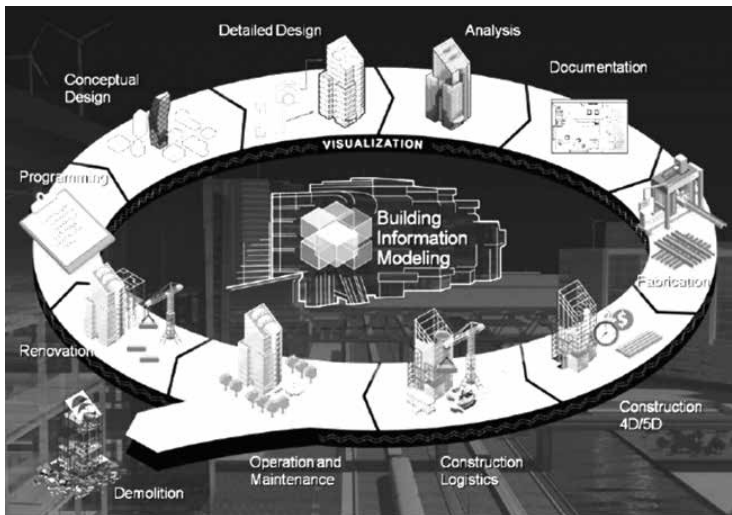


Figure 03: Building Information Modeling

Source: <http://buildipedia.com/in-studio/design-technology/the-daily-life-of-building-information-modeling-bim>

BIM includes valuable information about the entire building in particular and all the design documents saved in an integrated database. So eventually it clearly shows that a change to an element in the model inevitably will have an impact on the related set of construction. It is mentioned by Wong and Fan (2013) as, BIM consists of information representing the entire building and the complete set of design documents stored in an integrated database.

Benefits of BIM

The benefits of BIM are evident in its capability of capturing, organizing, integrating, maintaining and growing the vast amount of knowledge, data and information required to conceive, plan, design, construct, operate, maintain, adapt, renovate and, finally, beneficially deconstruct a building at the end of its life cycle. BIM has already given the industry measurable positives, as per cited in 'The Building SMART Data Dictionary (2008)' as follows:

- Increased understanding and predictability - offering greater certainty and reduced risk
- Improved efficiency
- Improved integration and coordination - meaning less problems onsite
- Less waste
- Better value and quality
- Better buildings throughout their life-cycle

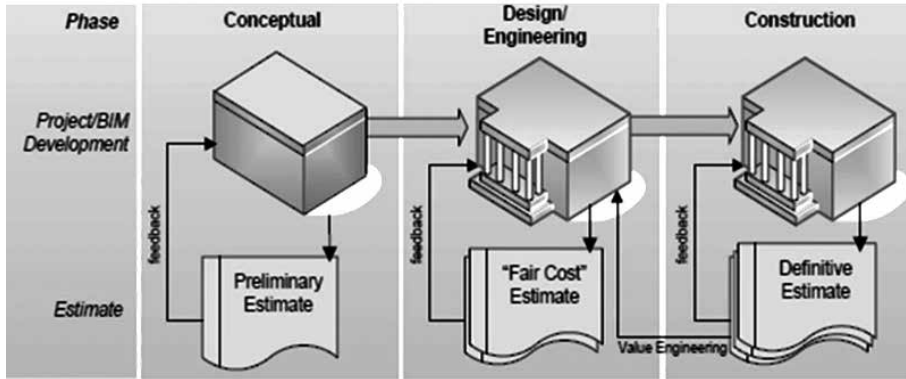
BIM and Quantity Surveyor

BIM has a great probable for amalgamation into construction projects life cycle which will conduct to pave the way towards becoming the industry standards for construction projects and hence would be a key tool in the project procurement in the future. As a result, key roles of Quantity Surveyors in building procurement which is based on BIM would be quite different from today's roles. There are uncertainties that adoption of BIM could threaten and challenge the existence of Quantity Surveying profession. There is some evidence to suggest that the architectural profession is beginning to come under pressure to adopt BIM. Hence, implementing BIM effectively requires significant changes in the way construction work at almost every level within the building process. Thus, it appears that the industry could benefit from a clear set of guidelines outlining an effective strategy and methodology of implementing BIM at the organizational level (Bernstein and Pittman, 2004).

Quantity Surveying Practice in Sri Lanka

Pre - Contract stage	Post - Contract stage
Preliminary cost estimating	Interim valuation and Payment
Procumbent Advice	Final account preparation
Cost planning	Settlement of contractual disputes
Measurement of Quantities	Cost control during construction
Preparing bills of Quantities	Analysis if Financial Risks
Bidding Process	Insurance Valuations

Table 1: Cost Management Roles of QS in the Construction Projects



Source: (Willis *et al.*, 1994, cited in Nagalingam *et al.*, 2013)

Figure 04: Project and Cost estimating process

Source: (Louise Sabol, 2008)

BIM Enabled Cost Estimating Practices

BIM apt the competency to prepare takeoffs, counts and measurements straight from a model. This delivers a procedure where information stays reliable during the project and variations can be readily accommodated. Building information modeling supports the whole project Lifecycle and provides the competence to assimilate costing efforts through all project phases. The phase of the project fluctuating from high level schematic models during preliminary phases, to detailed estimates as projects enter construction are desirable dependents of the information on a model and type of cost estimate. The ability to estimate is the most required skill for construction professionals. Estimating is a process that involves the science of technical computing processes and the art of creative problem solving to create reliable detailed estimates that quantify material, labor and equipment needs and associates these items with their related costs (Miller and Mills, 2002).

PROS and CONS of BIM Enabled Cost Estimating in Construction

- BIM technology can quote an accurate bill of quantities and spaces that can be used for cost estimation at any stage of the design.
- When using BIM for cost estimates, it is obviously required to have the common contractor and probably key trade contractors who will be accountable for building the structure, as part of the project team.
- The model is able to create cost estimates, bills of quantities and bills of materials which will be automatically updated as the model or any linked cost information changes (Ashcraft, 2007). This decreases human errors that could have crept in when generating these manually.

Figure 05 shows, is to use a specialized quantity takeoff tool that imports data from various BIM tools.

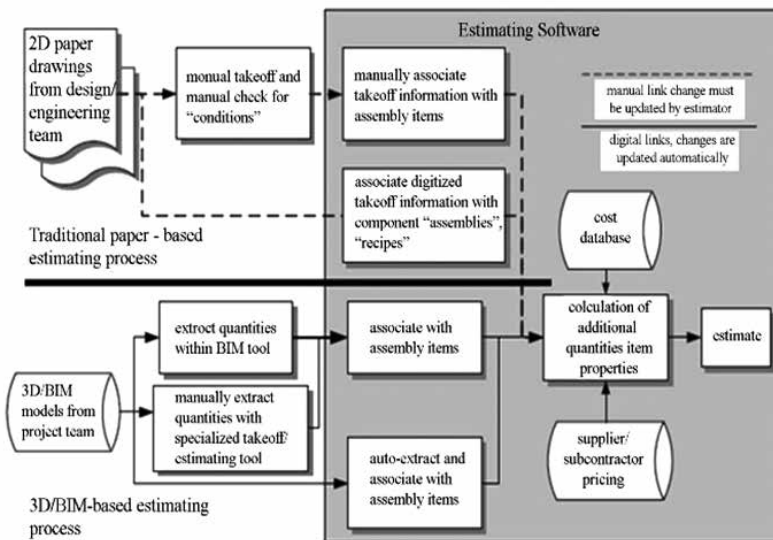


Figure 05: Conceptual diagram of a BIM quantity takeoff and estimating process.
Source: Eastman *et al.* (2011)

- On the other hand Interoperability which is a con for BIM based estimating, "the ability to manage and communicate electronic product and project data between collaborating firms and within individual companies design, construction, maintenance and business process systems" (Martinez and Scherer, 2006), known as interoperability defined by the National Institute of Standards and Technology. The construction industry is an extremely mutual industry in terms of information and data sharing in the design and execution processes, and will require becoming even more mutual when using systems and functions such as BIM. With no appropriate interoperability among the diverse stakeholders of a construction project, BIM will not be able to take flight. Since this is a problem even though where ever BIM is in practice, in the implementation stage of practice BIM in Sri Lanka by selecting the exact software this problem can be overcome

Challenges Face By QS in terms of Proper BIM Adoption for Cost Estimating Practice in Sri Lanka

The future of architecture and the construction industry in Sri Lanka is digital, of this there can be no hesitation, and BIM is the future of design and long term facility management, it is government led and technology driven, and it is executing alteration across all industries, but there is still much uncertainty about what exactly it is and how it should be developed and executed. BIM is a digital model which assists each one understands the building.

BIM offers the probable for an effective information model to be offered from Design Team (architects, surveyors, consulting engineers, and others) to Contractor and Subcontractors and then to the Owner. Each person accumulates their own additional knowledge and tracking of alterations to the single model.

Wang (2002) stated a major challenge is that most design firms are hesitant to practice on real projects. Therefore, they often set up a BIM group and let BIM guys work in parallel with the project's teams. How its effect is, the project will have a BIM model but the project's team will have had very limited contact to BIM. Not as good as yet, the BIM team attempts will add additional cost and many not contribute much savings, ridiculously this practice will often bring more cost to the project.

Conclusions

Estimating using Building Information Modeling (BIM) software, in conjunction with cost data, is a comprehensive process that maps components of three-dimensional building models to material, labor and equipment cost data.

BIM-enabled estimating is an interfacing process that allows the user to generate object quantities from an imported BIM model and that allows the user to perform cost estimating by linking quantities to cost data. While efficiency is significantly improved, to achieve maximum efficiencies a detailed BIM model and comprehensive and updated cost database is required. Overall, BIM estimating greatly improves accuracy of an estimate giving the estimator a better understanding of what is being estimated.

Quantity surveyors need to keep reinventing themselves and continually add value and enhance their professional services (Ashworth and Hogg, 2007). Quantity surveyors that are able to overcome these challenges will secure their future in the technologically developing industry with BIM in Sri Lankan context.

The incessantly shifting and technologically developing construction industry has forced quantity surveyors to change with it in order to meet these ever changing needs. The research in this report has confirmed this statement, and has shown that BIM, although a great advantage to the construction industry, will oblige quantity surveyors to keep reinventing themselves and develop the scope of their services in order to maintain their leading role as construction cost managers in Sri Lanka.

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Emerging concern of Tuberculosis in Sri Lanka

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Abstract

This paper focuses on the emerging concern on Tuberculosis in Sri Lanka due to the vaccination not covering the entire island, some immune suppressive disease and incomplete tuberculosis drug therapy. Also paper trying to explore many factors in terms of tuberculosis disease.

Introduction

Tuberculosis, a chronic lung infectious disease (Tucci, González-Sapienza and Marin, 2014) characterized by severe inflammation and granulomatous lesion formation in the lungs (Kothari *et al.* 2014). It is one of the most prevalent infectious diseases in the world (Ahmad, 2011) with children under 5 more susceptible to infection (Clinical Guideline, 2006). The causative agent is *Mycobacterium tuberculosis*; an aerobic gram-positive acid-fast bacillus having a cell wall containing mycolic acids (Gengenbacher and Kaufmann, 2012).

Transmission

Transmission is via inhalation of droplet-nuclei released from persons with active pulmonary TB (Schwander and Dheda, 2011). Once inhaled, the disease occurs if the bacterium escapes the host's innate defenses and reaches the alveoli. Macrophages engulf the bacteria forming granulomas (tubercles and ghon-focus; if associated with a lymph node) that limit replication and spread of *Mycobacterium*. The bacterium is able to reach a stage of dormancy within the macrophages by inhibiting the phagolysosome activity. Mycolic acids block lysosome activity (Ahmad, 2011). In immune-compromised individuals the initial infection presents as primary pulmonary TB whereas otherwise the infected persons remain asymptomatic (Achkar *et al.* 2011) however may progress towards the active disease state on re-infection; known as secondary TB. Disseminated or miliary TB and extra-pulmonary TB occurs as secondary to poor host defenses such as in immune-compromised patients (HIV patients) (Tucci, González-Sapienza and Marin, 2014).

Clinical Manifestations and Disease Prevention

Clinical manifestations of Tuberculosis include fever, night sweats, weight loss, weakness, anorexia, lethargy and cough possibly with hemoptysis. Standard treatment regimen includes 4 antibiotics (rifampin, isoniazid, pyrazinamide and ethambutol) for 2 months, of which 2 are sustained for the subsequent 4 months. Latent infection treatment is recommended for the at-risk populations (Oliphant, 2015). Vaccination is an effective preventive measure that has been established in Sri-Lanka. The vaccines include BCG vaccine for infants (Gengenbacher and Kaufmann, 2012), freeze-drying and r-RNA vaccines. Control measures include careful management of patient, such as advising the patient to continue the drugs for the prescribed period, follow regular visits to the clinic and encourage the individuals at risk for acquiring the disease to get vaccinated.

Incidence of Tuberculosis between years 2008-2012 in Sri Lanka

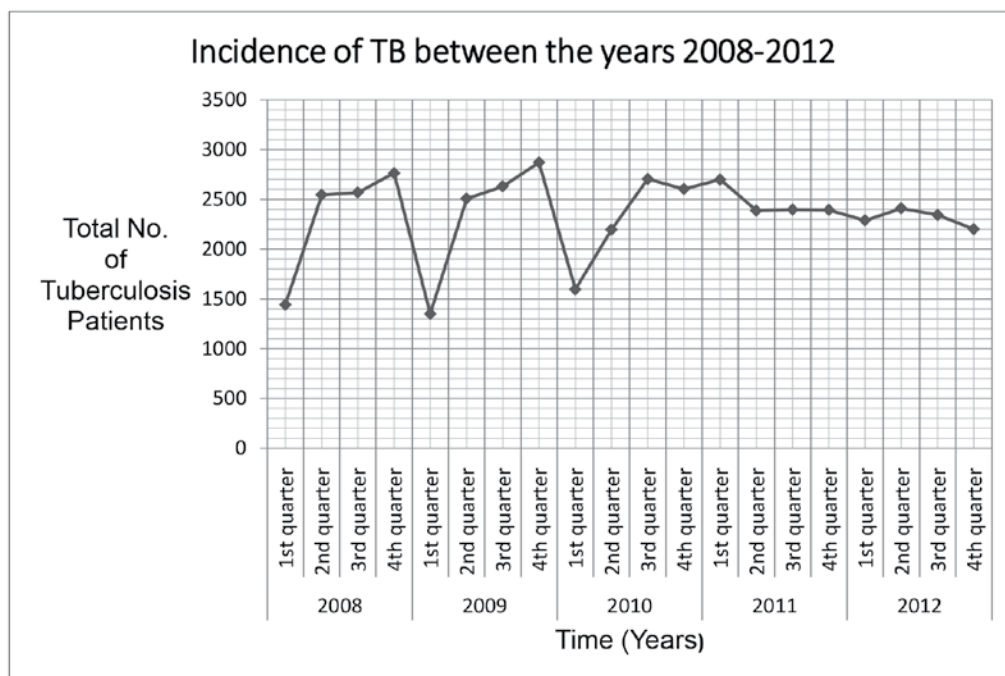


Figure 1: Quarterly breakdown of the incidence of Tuberculosis in Sri-Lanka between the years 2008-2012 (Sri Lanka Epidemiology Unit Ministry of Health)

As illustrated by the figure 1.0 a pattern can be observed in the quarterly incidence of TB in the years 2008 and 2009 where the incidence rises steeply from the first-quarter to the second-quarter. The incidence from the second-quarter to the third and to the fourth-quarter raises slightly, the slopes being much less steep. In the years 2008 and 2009 the fourth-quarter reported the highest incidences of TB as compared to the other quarterly breakdowns. The incidence from the fourth-quarter to the incidence in the first-quarter of next year drops substantially. However the incidence for the year 2010 rises from first-quarter to the third-quarter after which the incidence declines gradually over the years, that is, the incidence of TB in the country drops gradually from the third-quarter of 2010 and continues to generally drop with time although the variation of the incidence is much less and therefore a steady incidence of TB can be observed in the country during these years. However the incidence of TB in the fourth-quarter of 2012 is higher than the incidence in the first-quarter of 2008, 2009 and 2010. The lowest incidence was in the first-quarter of 2009, with an incidence of 1350 reported cases. The highest incidence was recorded in the fourth-quarter of 2009 - 2871. In the later years the variation of the incidence of TB is minimal as compared with the first three years in question.

The reasons for the variation in incidence could be the extent of coverage of the BCG vaccination, in some quarters more people were vaccinated than in other quarters. However in contradiction Gengenbacher and Kaufmann (2012) suggested that the current BCG vaccine is effective against severe childhood TB and not adult pulmonary

TB and therefore has no impact on transmission. Increased supportive and preventive care may have contributed to controlling the disease and therefore a steady incidence value may be achieved as observed in the later years. The incidence of TB may also be associated with the number of HIV patients (Sharma and Mohan, 2004) as immune-compromised people are more susceptible to infection; this is especially true of extra-pulmonary TB (Shiloh and Champion, 2010). Effectiveness of antibiotics may have reduced with time as resistant bacterial strains have evolved leading to relapses and re-activation (Mukhopadhyay, Nair and Ghosh, 2012).

Rise in population accompanied with unfortunate financial status of the citizens-associated with poor nutrition and health care facilities leads to poor control in transmission and treatment of the disease. Public transport (Horsburg, 2014) and overcrowded areas including close proximity residencies positively (Ahmad, 2011) contribute to the transmission of the disease (Schwander and Dheda, 2011). In addition the civil war prevalent in the country during the years 2008/2009 may have had an influence on the incidence of TB and hence led to highest incidence of TB during that year. Reactivation of latent TB due to drug resistance or immune-deficiencies may also lead to increase in the occurrence of TB. All of these reasons may have contributed to the- although stable; higher incidence of TB between the later part of 2010 to 2012.

Current conventional diagnostic methods and their strengths and weaknesses

Mycobacterium tuberculosis is typically diagnosed by *M. tuberculosis* isolation in bacteriological culture and acid-fast bacilli sputum smear microscopy. Diagnosis via culture technique is the gold standard for definitive diagnosis of pulmonary and extra-pulmonary TB, while the sputum smear-microscopy for pulmonary TB (Tucci, González-Sapienza and Marin, 2014). Sputum culture is the standard method for diagnosing active TB accompanied with patient history, clinical, radiographic, and laboratory findings. For suspected patients with abnormal findings on chest radiography a sputum smear for the detection of Acid-Fast Bacilli must be performed to aid in the diagnosis of active TB. Three sputum samples must be collected in the early morning for three consecutive days. To diagnose active non-respiratory TB, a culture must be done from the biological sample such as a biopsy from the site of infection; lymph node biopsy and pleural biopsy (Clinical Guideline, 2006). The results are available within 24 hours. Anterior-posterior chest x-rays suggestive of TB require further diagnostic investigations (Clinical Guideline, 2006) as otherwise; only an inconclusive diagnosis can be made (Rigouts, 2009). Since mycobacterium is a slow-growing organism a solid culture may take 4-6 weeks while a liquid culture may take 1-3 weeks to confirm a clinical diagnosis. This can be followed by antimicrobial susceptibility testing whose duration is about 2-4 weeks (Oliphant, 2015). Nevertheless these methods especially culture although specific is time-consuming as suggested by Horsburgh (2014) and smear, although the cheapest; suffers from sensitivity and specificity limitations; resulting in false-positives and false-negatives (Tucci, González-Sapienza and Marin, 2014).

Another diagnostic test is the tuberculin skin test or mantoux test where the infected persons may be identified 6-8 weeks after exposure to the bacilli, hence may not indicate active infection (Munir *et al.* 2011). The test is based on a delayed-type hypersensitivity response to a complex combination of *M. tuberculosis* antigens, known as purified protein derivative (PPD). An induration greater than 5mm, recorded 48 to 72 hours after

injection of PPD, is considered positive (Ahmad, 2011). The test is cheap and relatively easy to perform. However this test, like smear, lacks sensitivity and specificity, therefore does not differentiate between mycobacterium tuberculosis and infection from other mycobacterium strains in the environment. Furthermore a false-positive result may be obtained a few years after the BCG vaccination (Ahmad, 2011). False-negatives can occur in immune-compromised individuals (Clinical Guideline, 2006).

Recent and Future advances in laboratory diagnostic methods and their strengths and weaknesses

More sensitive and specific tests exist such as cell-mediated immunity-based Interferon-Gamma Release Assays (IGRAs) (Lucke, 2011). The only disadvantage of IGRAs is that they cannot be used to distinguish between active disease and latent tuberculosis infection in immunocompetent individuals. However they help diagnose active TB infection even with sample from site of infection not necessarily blood (Ahmad, 2011). According to Oliphant (2015) a tuberculin skin test or an Interferon Gamma Release Assay is used to confirm a latent TB infection diagnosis. Tuberculosis antigens not present in BCG and rarely in environmental mycobacterial species are employed for diagnosis of latent infection and dormant bacteria. False-positive and more commonly false-negative results may be obtained occasionally. (Clinical Guideline, 2006).

Recent and future advances involve the use of pathogenic antigens as biomarkers for the disease. Antigen detection assays for antigens such as Lipoarabinomannan, are based on a sandwich capture ELISA format to detect the antigen in sputum or urine sample. Protein antigens assayed are identified by electrophoresis and mass spectrophotometry. (Tucci, González-Sapienza and Marin, 2014). Cross contamination with environmental mycobacterial species is common (Du Preez and Loots, 2014)

PCR based rapid diagnostic methods; Nucleic Acid Amplifications yield much quicker results (Lucke, 2011). This method involves purifying, amplifying, and identifying targeted nucleic acid sequences, via hybridization, in the TB genome, and providing results from unprocessed sputum samples within 2 hours. This test is highly sensitive for diagnosing pulmonary and extra-pulmonary TB, example; the gene coding for MoeX, unique to the *M. tuberculosis* complex, was clinically validated as a diagnostic biomarker for active pulmonary TB (Tucci, González-Sapienza and Marin, 2014). In-addition to rapid results, these tests can detect low concentrations of not-necessarily live bacterium. These are highly sensitive and specific and are used in combination with acid-fast bacilli staining to positively conclude tuberculosis infection (Munir *et al.* 2011). The only drawback, in addition to high cost, is that Nucleic Acid Amplification tests may remain positive even after treatment completion (Oliphant, 2015).

Quality Control Measures

Laboratories employing these tests must be well-equipped and possess a well-experienced working staff as these techniques, especially culture, smear microscopy and PCR techniques, must be carried out carefully with minimal contamination. Internal quality control measures for such laboratories include compartmentalized lab working areas, experienced staff, well-maintained equipment; microscopes and a constant source of electricity and water. This ensures quality of the service provided and hence an accurate diagnosis, which is less-likely in resource-poor countries (Du Preez and

Loots, 2014). Quality assurance programs including quality control and external quality assessments (Jou, 2011) along with sensitive, easy and rapid point-of-care diagnostics, well-designed laboratory infrastructure, well-trained; sufficient staff to handle the workload; all ensure the quality of the diagnostic procedures for that lab (Parsons *et al.* 2011). External quality control measures may involve pre-analytical stages such as proper instruction to patient on way of obtaining and collecting sputum samples for diagnostic tests and subsequent handling; all ensure the precision of the sample for the particular test (Silva, Bazzo and Chagas, 2010).

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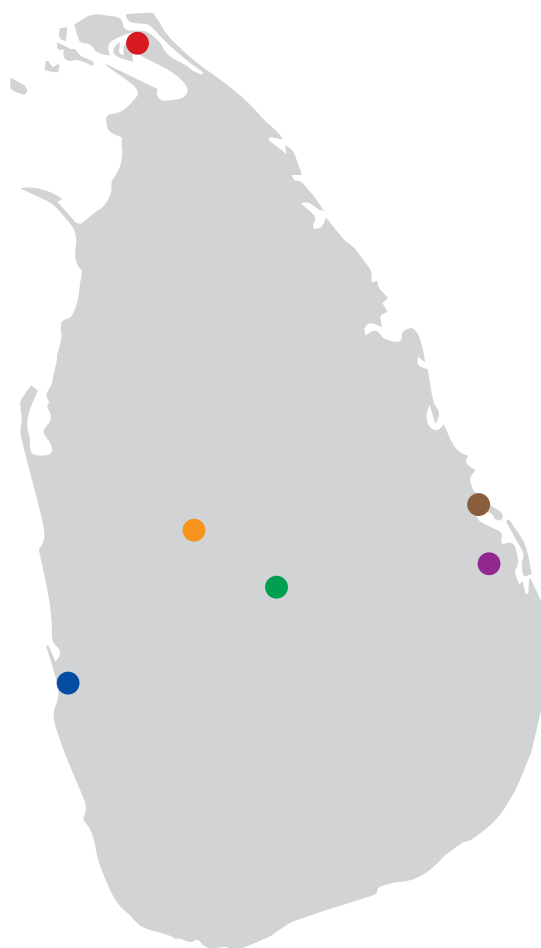
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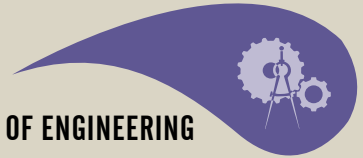
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